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4.9 TRAFFIC AND CIRCULATION

4.9.1 INTRODUCTION

The purpose of this traffic impact analysis is to assess the potential circulation impacts associated with development of the proposed project. The traffic analysis presented in this section is based primarily on the Traffic Impact Analysis Report prepared by Linscott, Law, and Greenspan Engineers (2004). The report is provided for review in Appendix G of this EIR. The analysis contained in the Traffic Impact Analysis Report satisfies the traffic impact requirements of the Cities of Long Beach and Signal Hill and is consistent with the 2002 Congestion Management Program (CMP) for Los Angeles County.

The traffic analysis evaluates the existing operating conditions at 18 intersections within the project vicinity and 5 site driveways, estimates the trip generation potential of the proposed sports park, and forecasts future intersection operating conditions at completion and occupancy of the project. Intersection improvements and mitigation measures are identified. An evaluation of the project's parking needs is provided based on the City of Long Beach off-street parking code.

4.9.2 EXISTING ENVIRONMENTAL SETTING

Existing Street Network

The San Diego Freeway, or Interstate 405 (I-405), provides regional access to the project site. Freeway access to the project site is provided via the Atlantic Avenue/I-405 interchange, the Orange Avenue/I-405 SB ramps interchange, the 32nd Street/I-405 NB ramps interchange, the Cherry Avenue/I-405 interchange, and the Temple Avenue/I-405 interchange.

The principal local network of streets serving the project includes Willow Street, Spring Street, Atlantic Avenue, California Avenue, Orange Avenue, Cherry Avenue, 32nd Street, and Wardlow Road. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions.

Willow Street is a six-lane divided roadway oriented in an east-west direction with a raised center median, providing three travel lanes in each direction. Parking is not permitted along either side of this roadway within the vicinity of the project. The posted speed limit on Willow Street is 40 miles per hour (mph). Existing weekday and weekend daily traffic volumes on Willow Street between California Avenue and Orange Avenue total approximately 31,670 vehicles per day (vpd) and 24,630 vpd, respectively. This roadway is classified as a Major Highway in the City of Signal Hill Circulation Element.

Spring Street is a four-lane divided roadway oriented in an east-west direction that borders the project site to the north. Spring Street is designated as a major roadway with a 100-foot right-of-way. Spring Street at Orange Avenue and Spring Street at California Avenue are controlled by two-phase traffic signals. Parking is permitted on either side of this roadway within the vicinity of the project.

The posted speed limit on Spring Street is 40 mph. Spring Street provides access to the commercial parcel via a proposed full access driveway. Spring Street at the project site between Orange Avenue and California Avenue has previously been widened to an 84-foot curb-to-curb width within a 100-foot right-of-way except for a short section on the north side of Spring Street east of California Avenue. Existing weekday and weekend daily traffic volumes on Spring Street between California Avenue and Orange Avenue total approximately 13,690 vpd and 8,055 vpd, respectively. This roadway is classified as a Major Highway in the City of Signal Hill Circulation Element.

Spring Street was widened between Long Beach Boulevard and California Avenue under the Spring Street Corridor Agreement with the County of Los Angeles and the Cities of Long Beach and Signal Hill. Widening improved the street to an 84-foot curb-to-curb width within a 100-foot right of way, providing left-turn lanes, traffic signal improvements, and two travel lanes in each direction.

Atlantic Avenue is a four-lane divided roadway oriented in a north-south direction with a raised center median, providing two lanes of travel in each direction. Parking is not permitted along either side of this roadway within the vicinity of the project. The posted speed limit on Atlantic Avenue is 35 mph. Existing weekday and weekend daily traffic volumes on Atlantic Avenue between Spring Street and Willow Street total approximately 31,040 vpd and 25,200 vpd, respectively. This roadway is classified as a Major Arterial in the City of Long Beach Circulation Element.

California Avenue is a two-lane divided roadway oriented in a north-south direction that borders the project site to the west. The roadway lies within the City of Signal Hill adjacent to the subject area and is designated in the City of Signal Hill Circulation Element as a Secondary Modified Highway with a 70-foot right-of-way requirement, a 60-foot paved width south of Spring Street, and a local Collector north of Spring Street. California at Spring and California at Willow are controlled by two-phase traffic signals. Parking is not permitted on either side of this roadway within the vicinity of the project. The posted speed limit on California Avenue is 40 mph. Existing weekday and weekend daily traffic volumes on California bordering the site total approximately 5,160 vpd and 3,835 vpd, respectively.

Orange Avenue is a two-lane divided roadway oriented in a north-south direction that borders the project site to the east. A two-way left-turn lane separates northbound and southbound traffic. In the future, Orange Avenue will provide two lanes in each direction. Immediately south of Spring Street, the roadway merges into one lane in each direction with left-turn lanes to the south. According to the City of Signal Hill, south of Spring Street, Orange Avenue has been reclassified and is designated as a Secondary Highway with an 80-foot right-of-way requirement and 64-foot paved width. Parking is not permitted on either side of this roadway within the vicinity of the project. The posted speed limit on Orange Avenue is 40 mph. Orange Avenue provides access to the project site via three (3) driveways. Existing weekday and weekend daily traffic volumes on Orange Avenue adjacent to the project site total approximately 13,180 vpd and 10,260 vpd, respectively.

Cherry Avenue is a six-lane divided roadway oriented in a north-south direction, providing three lanes of travel in each direction. Parking is not permitted along either side of this roadway within the vicinity of the project. The posted speed limit on Cherry Avenue is 40 mph. Cherry Avenue is classified as a Major Highway in the City of Signal Hill Circulation Element.

Thirty-Second Street is a two-lane undivided roadway oriented in an east-west direction. Parking is permitted along either side of this roadway within the vicinity of the project. The posted speed limit on

32nd Street is 25 mph. 32nd Street is classified as a Local Street in the City of Signal Hill Circulation Element.

Wardlow Road is a four-lane divided roadway oriented in an east-west direction, providing two lanes of travel in each direction. Parking is permitted along either side of this roadway within the vicinity of the project. The posted speed limit on Wardlow Road is 35 mph.

Thirteen of the key study intersections currently operate at LOS D or better during the p.m. peak commute hour. Five of the eighteen key study intersections currently operate at an unacceptable LOS (LOS E or worse) during the weekday p.m. peak commute hour. The intersections of Atlantic Avenue at Willow Street, Cherry Avenue at Willow Street, Atlantic Avenue at Spring Street, and Cherry Avenue at Spring Street currently operate at unacceptable LOS E during the p.m. peak commute hour (adverse ICU/LOS values are shown in bold). Although overall the unsignalized intersection of the I-405 SB ramps at Orange Avenue operates at LOS B during the p.m. peak hour, the minor street (I-405 SB off-ramp) approach currently operates at LOS F during the p.m. peak hour.

All 18 key study intersections currently operate at LOS D or better during the weekend day (Saturday) midday peak hour.

Existing Public Transit

Public transit service in the vicinity of the proposed project is provided by Long Beach Transit (LBT). The project site is currently serviced by LBT Line 7 (Orange Avenue) and Line 60 (Atlantic Avenue). LBT Line 7 travels north and south on Orange Avenue adjacent to the site, with a bus stop at the intersection of Orange Avenue and Willow Street. LBT Line 7 operates during weekdays between the hours of 5:30 a.m. and 8:00 p.m., with 20-minute headways throughout most of the day; on weekends, this bus route operates from 6:00 a.m. to 10:00 p.m., with 40-minute headways. Line 7 provides 74 trips on weekdays and 48 trips each on Saturday and Sunday.

LBT Line 60 (Atlantic) on Atlantic Avenue offers service .2 miles west of the project site, which is within national standards for acceptable walking distances to bus stops within urban areas. Line 60 provides 178 trips on weekdays and 128 trips each Saturday and Sunday.

LBT Line 100 and Routes 101 and weekday 103 also operate on Atlantic between Carson Street and Willow Street. Route 102, with a stop at the intersection of Willow Street and Cherry Avenue, runs east and west on Willow Street just south of the proposed project. LBT Route 102 operates during weekdays between the hours of 6:00 a.m. and 7:30 p.m., with 30-minute headways throughout most of the day; this bus route does not operate during weekends.

Additional LBT lines within a mile of the proposed project are located on Atlantic Avenue, Cherry Avenue, and Wardlow Road. LBT Routes 61, 62, 101, and 103 run north and south on Atlantic Avenue and LBT Routes 21, 22, 23, and 131 run north and south on Cherry Avenue. LBT Route 131 runs east and west on Wardlow Road.

The LBT service area extends beyond the City of Long Beach into portions of Signal Hill, Cerritos, Lakewood, San Pedro, Paramount, Compton, Los Angeles, Hawaiian Gardens, and Seal Beach. All LBT

routes connect with the Metro Blue Line light rail rapid transit system. Bus transfers provide for discounted fares on the Blue Line.

Bike Routes

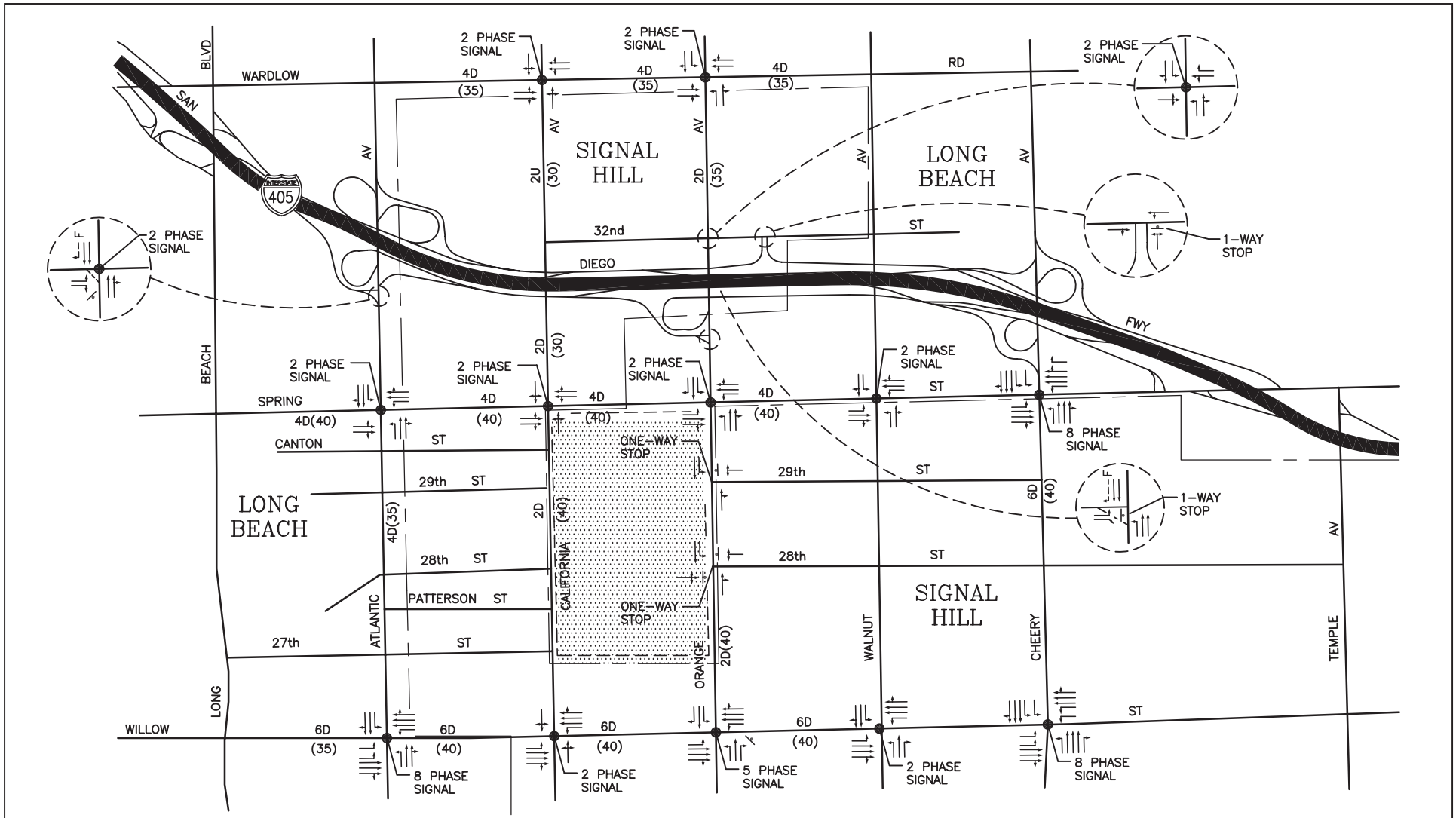
The Transportation Element of the *Long Beach General Plan* identifies bike routes within the City. The system is intended to provide alternative transportation facilities. Although the General Plan does not identify any bike routes that currently extend to the project site, the Long Beach Bicycle Master Plan identifies Orange Avenue adjacent to the project site as a future Class III bike route. The nearest routes are located west of the project site parallel to Pacific Coast Highway.

Existing Area Traffic Volumes

The existing and future traffic operating conditions were evaluated at 18 key intersections. The location of each study area intersection is shown on Figure 4.9.1. These key intersections were selected for evaluation based on discussions with the City of Long Beach and the City of Signal Hill and in consideration of the criteria in the current County of Los Angeles CMP traffic impact guidelines. Some portion of potential project-related traffic will pass through each of the following intersections:

1) Atlantic Avenue at Willow Street (Long Beach)
2) California Avenue at Willow Street (Signal Hill)
3) Orange Avenue at Willow Street (Signal Hill)
4) Walnut Avenue at Willow Street (Signal Hill)
5) Cherry Avenue at Willow Street (Signal Hill)
6) Orange Avenue at 28th Street (Long Beach/Signal Hill)
7) Orange Avenue at 29th Street (Long Beach/Signal Hill)
8) Atlantic Avenue at Spring Street (Long Beach)
9) California Avenue at Spring Street (Long Beach/Signal Hill)
10) Orange Avenue at Spring Street (Long Beach/Signal Hill)
11) Walnut Avenue at Spring Street (Long Beach/Signal Hill)
12) Cherry Avenue at Spring Street (Long Beach/Signal Hill)
13) I-405 SB ramps at Orange Avenue (Long Beach)
14) 32nd Street at Orange Avenue (Signal Hill)
15) I-405 NB ramps at 32nd Street (Signal Hill)
16) Atlantic Avenue at I-405 SB ramps (Long Beach)
17) California Avenue at Wardlow Road (Long Beach)
18) Orange Avenue at Wardlow Road (Long Beach)

Existing weekday p.m. peak-hour traffic volumes and existing weekend noon peak-hour traffic volumes for the eighteen key study intersections are presented in Figures 4.9.2 and 4.9.3, respectively. An analysis of the average daily traffic (ADT) volumes on the 13 key roadway segments within the project vicinity for a "typical" weekday and Saturday indicates that on a daily basis, traffic volumes are significantly greater during a "typical" weekday than on a weekend day (Saturday). On-street traffic during the weekend gradually builds and peaks at the noon hour, then steadily decreases. Nevertheless,



LSA

KEY

= APPROACH LANE ASSIGNMENT

= FREE RIGHT–TURN LANE

= TRAFFIC SIGNAL, = STOP SIGN

(XX) = POSTED SPEED LIMIT

2 = NUMBER OF TRAVEL LANES

D = DIVIDED U = UNDIVIDED

N

SOURCE: Linscott, Law & Greenspan.

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FIGURE 4.9.1

Long Beach Sports Park

Existing Roadway Conditions and Intersection Controls

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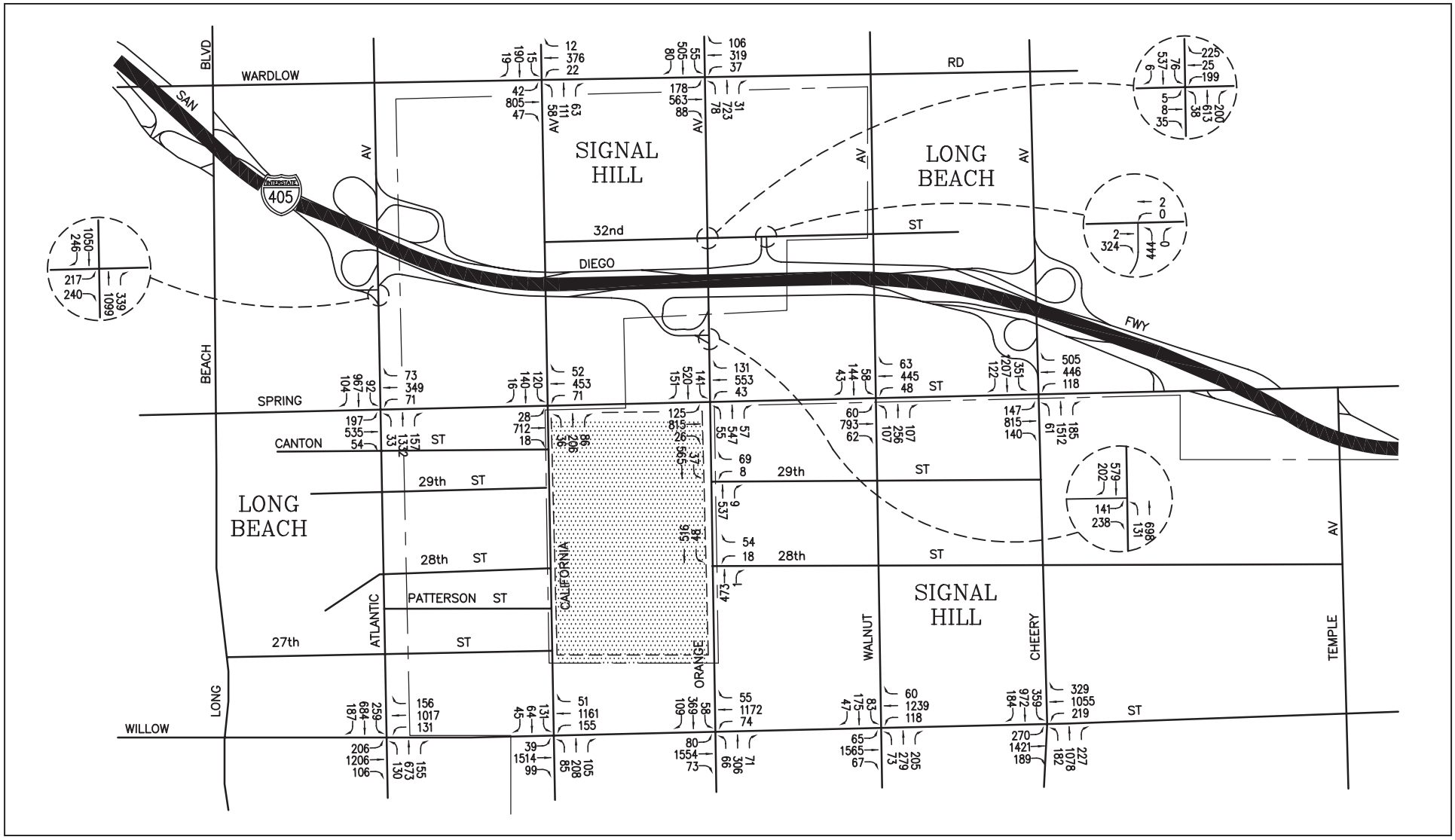

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FIGURE 4.9.2

Long Beach Sports Park
Existing Weekday
PM Peak Hour Traffic Volumes

SOURCE: Linscott, Law & Greenspan.

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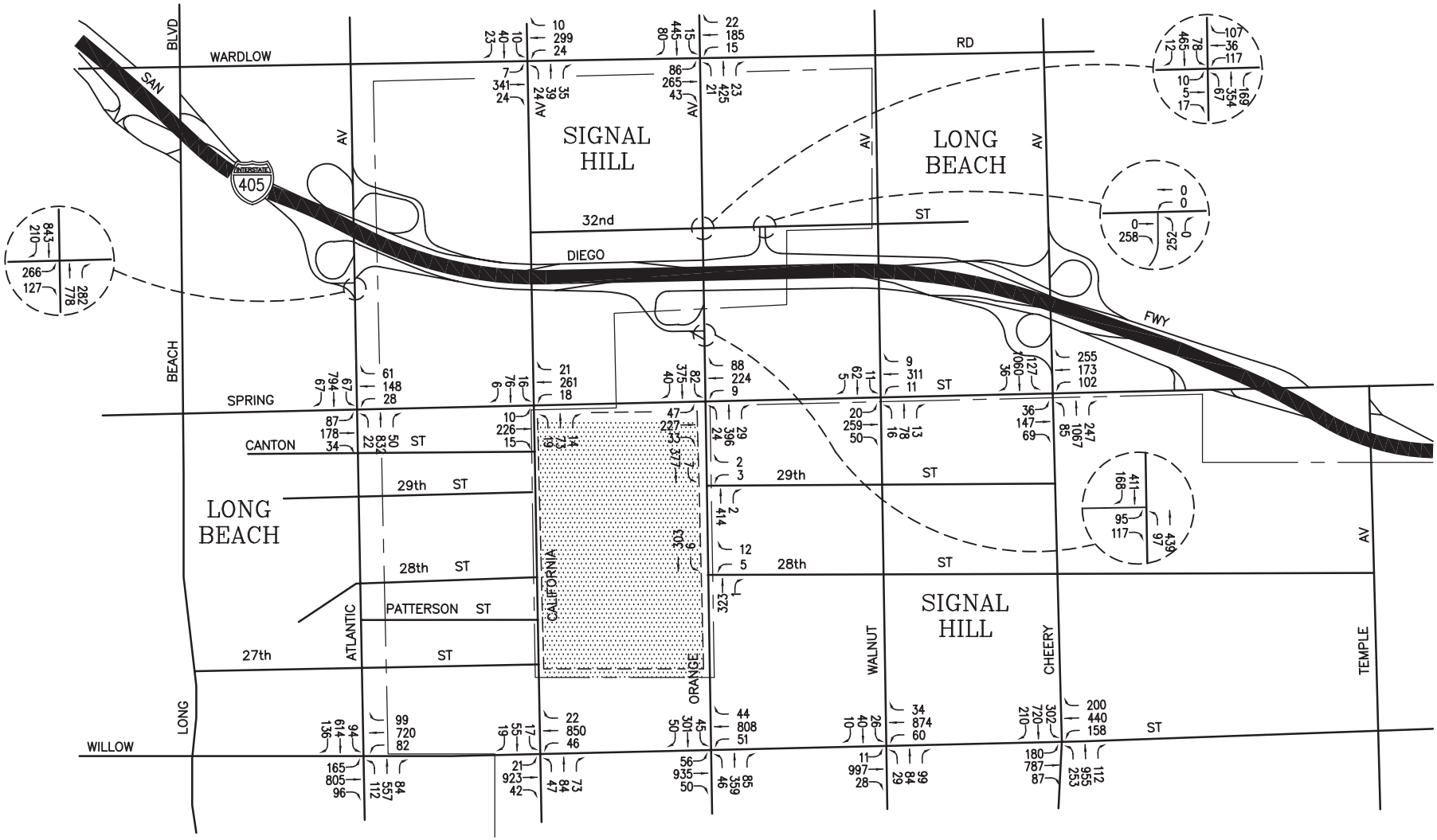

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FIGURE 4.9.3

Long Beach Sports Park

Existing Weekend Day Noon
Peak Hour Traffic Volumes

SOURCE: Linscott, Law & Greenspan.

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for individual hours from 6:00 a.m. to 6:00 p.m., on-street traffic in the immediate area of the project is greater on a "typical" weekday than on a weekend day (Saturday).

As presented in Table 4.9.A, 13 of the key study intersections currently operate at LOS D or better during the p.m. peak commute hour. The intersections of Atlantic Avenue at Willow Street, Cherry Avenue at Willow Street, Atlantic Avenue at Spring Street, and Cherry Avenue at Spring Street currently operate at an unacceptable LOS E during the p.m. peak commute hour (adverse ICU/LOS values are shown in bold). Although the unsignalized intersection of the I-405 SB ramps at Orange Avenue overall operates at LOS B during the p.m. peak hour, the minor street (I-405 SB off-ramp) approach currently operates at LOS F during the p.m. peak hour.

Table 4.9.B summarizes the weekday midday peak-hour service levels calculated for each of the 18 key study intersections for a "typical" weekday based on the existing Year 2002 traffic volumes, current land configurations, and intersection controls. Each of the key study intersections operates at an adequate service level during the midday peak hour based on the Cities of Long Beach and Signal Hill LOS standards. Further, all minor street approaches at the four key unsignalized study intersections currently operate at LOS D or better during the weekend midday peak hour.

4.9.3 METHODOLOGY

The relative impacts of the added peak-hour project traffic volumes generated by the proposed Long Beach Sports Park have been evaluated based on the analysis of future operating conditions at 18 key study intersections. Operating conditions at the key study intersections were evaluated during the weekday p.m. peak hour and the weekend day midday peak hour for existing 2002 traffic conditions and future 2006 traffic conditions without, and then with, the proposed project.

Existing Intersection Conditions

In conformance with the City of Long Beach and Los Angeles County CMP requirements, existing peak-hour operating conditions for key intersections were investigated according to the Intersection Capacity Utilization (ICU) method. The ICU technique reflects the flow characteristics of signalized intersections and estimates the volume-to-capacity (V/C) relationship for an intersection based on individual V/C ratios for key conflicting movements. The ICU numerical value represents the percent of required signal green time, and thus capacity, required by existing or future traffic. It should be noted that the ICU methodology assumes uniform traffic distribution per intersection approach lane.

The ICU value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The six qualitative categories of Level of Service that have been defined, along with the corresponding ICU value range, are shown in Table 4.9.C. The ICU value is the sum of the critical V/C ratios at an intersection; it is not intended to be indicative of the LOS of each of the individual turning movements.

Table 4.9.A: Existing Weekday PM Peak-Hour Level of Service Summary[1]

Key Signalized Intersection		**City Jurisdiction**	**Control Type**	**ICU (V/C Ratio)**	**LOS**
1.	Atlantic Avenue at Willow Street	Long Beach	8∅ Traffic Signal	**0.956**	**E**
2.	California Avenue at Willow Street	Signal Hill	2∅ Traffic Signal	0.782	C
3.	Orange Avenue at Willow Street	Signal Hill	5∅ Traffic Signal	0.807	D
4.	Walnut Avenue at Willow Street	Signal Hill	2∅ Traffic Signal	0.740	C
5.	Cherry Avenue at Willow Street	Signal Hill	8∅ Traffic Signal	**0.946**	**E**
8.	Atlantic Avenue at Spring Street	Long Beach	2∅ Traffic Signal	**0.913**	**E**
9.	California Avenue at Spring Street	Long Beach/ Signal Hill	2∅ Traffic Signal	0.542	A
Key Unsignalized Intersection		**City Jurisdiction**	**Control Type**	**Delay (sec/veh)**	**LOS**
6.	Orange Avenue at 28th Street[2]	Long Beach/ Signal Hill	One-Way Stop Control		
		• Overall Delay		1.34 s/v	A
		• Minor Approach Delay		15.1 s/v	C
7.	Orange Avenue at 29th Street[2]	Long Beach/ Signal Hill	One-Way Stop Control		
		• Overall Delay		1.16 s/v	A
		• Minor Approach Delay		14.3 s/v	B

Note: ∅ refers to signal phases

[1] **BOLD ICU/LOS values** indicate adverse service levels based on City LOS standards. Appendix C of the Traffic Impact Analysis Report contains ICU/LOS and HCM/LOS calculation sheets for all study intersections.

[2] This key intersection was analyzed using the HCM Unsignalized Methodology. LOS is based upon average delay, in seconds per vehicle, for the entire intersection.

Table 4.9.A: Existing Weekday PM Peak-Hour Level of Service Summary[1] (continued)

Key Intersection		City Jurisdiction	Control Type	ICU (V/C Ratio)	LOS
10.	Orange Avenue at Spring Street	Long Beach/ Signal Hill	2∅ Traffic Signal	0.751	C
11.	Walnut Avenue at Spring Street	Long Beach/ Signal Hill	2∅ Traffic Signal	0.660	B
12.	Cherry Avenue at Spring Street	Long Beach/ Signal Hill	8∅ Traffic Signal	**0.942**	**E**
14.	32nd Street at Orange Avenue	Signal Hill	2∅ Traffic Signal	0.796	C
16.	Atlantic Avenue at I-405 SB ramps	Long Beach	2∅ Traffic Signal	0.699	B
17.	California Avenue at Wardlow Road	Long Beach	2∅ Traffic Signal	0.524	A
18.	Orange Avenue at Wardlow Road	Long Beach	2∅ Traffic Signal	0.864	D
Key Unsignalized Intersection		**City Jurisdiction**	**Control Type**	**Delay (sec/veh)**	**LOS**
13.	I-405 SB ramps at Orange Avenue[2]	Long Beach	One-Way Stop Control		
		• Overall Delay		10.28 s/v	B
		• Minor Approach Delay		**45.3 s/v**	**E**
15.	I-405 NB ramps at 32nd Street	Signal Hill	One-Way Stop Control		
		• Overall Delay		8.17 s/v	A
		• Minor Approach Delay		14.2 s/v	B

[1] **BOLD ICU/LOS values** indicate adverse service levels based on City LOS standards. Appendix C of the Traffic Impact Analysis Report contains ICU/LOS and HCM/LOS calculation sheets for all study intersections.

[2] Existing volumes at this key intersection warrant the installation of a traffic signal (see Appendix B of the Traffic Impact Analysis Report for warrant sheet).

Table 4.9.B: Existing Weekend Midday Peak-Hour Level of Service Summary[1]

Key Intersection		City Jurisdiction	Control Type	ICU (V/C Ratio)	LOS
1.	Atlantic Avenue at Willow Street	Long Beach	8∅ Traffic Signal	0.723	C
2.	California Avenue at Willow Street	Signal Hill	2∅ Traffic Signal	0.458	A
3.	Orange Avenue at Willow Street	Signal Hill	5∅ Traffic Signal	0.639	B
4.	Walnut Avenue at Willow Street	Signal Hill	2∅ Traffic Signal	0.421	A
5.	Cherry Avenue at Willow Street	Signal Hill	8∅ Traffic Signal	0.769	C
8.	Atlantic Avenue at Spring Street	Long Beach	2∅ Traffic Signal	0.529	A
9.	California Avenue at Spring Street	Long Beach/ Signal Hill	2∅ Traffic Signal	0.260	A
Key Unsignalized Intersection		**City Jurisdiction**	**Control Type**	**Delay (sec/veh)**	**LOS**
6.	Orange Avenue at 28th Street[2]	Long Beach/ Signal Hill	One-Way Stop Control		
		• Overall Delay		0.36 s/v	A
		• Minor Approach Delay		11.1 s/v	B
7.	Orange Avenue at 29th Street[2]	Long Beach/ Signal Hill	One-Way Stop Control		
		• Overall Delay		0.15 s/v	A
		• Minor Approach Delay		13.5 s/v	B

[1] **BOLD ICU/LOS values** indicate adverse service levels based on City LOS standards. Appendix C of the Traffic Impact Analysis Report contains ICU/LOS and HCM/LOS calculation sheets for all study intersections.

[2] This key intersection was analyzed using the HCM Unsignalized Methodology. LOS is based upon average delay, in seconds per vehicle, for the entire intersection.

Table 4.9.B: Existing Weekend Midday Peak-Hour Level of Service Summary[1] (continued)

Key Intersection		City Jurisdiction	Control Type	ICU (V/C Ratio)	LOS
10.	Orange Avenue at Spring Street	Long Beach/ Signal Hill	2∅ Traffic Signal	0.476	A
11.	Walnut Avenue at Spring Street	Long Beach/ Signal Hill	2∅ Traffic Signal	0.277	A
12.	Cherry Avenue at Spring Street	Long Beach/ Signal Hill	8∅ Traffic Signal	0.636	B
14.	32nd Street at Orange Avenue	Signal Hill	2∅ Traffic Signal	0.572	A
16.	Atlantic Avenue at I-405 SB ramps	Long Beach	2∅ Traffic Signal	0.597	A
17.	California Avenue at Wardlow Road	Long Beach	2∅ Traffic Signal	0.277	A
18.	Orange Avenue at Wardlow Road	Long Beach	2∅ Traffic Signal	0.564	A
Key Unsignalized Intersection		**City Jurisdiction**	**Control Type**	**Delay (sec/veh)**	**LOS**
13.	I-405 SB ramps at Orange Avenue[2]	Long Beach	One-Way Stop Control		
		• Overall Delay		3.65 s/v	A
		• Minor Approach Delay		16.1 s/v	C
15.	I-405 NB ramps at 32nd Street	Signal Hill	One-Way Stop Control		
		• Overall Delay		5.34 s/v	A
		• Minor Approach Delay		10.8 s/v	B

1 **BOLD ICU/LOS values** indicate adverse service levels based on City LOS standards. Appendix C of the Traffic Impact Analysis Report contains ICU/LOS and HCM/LOS calculation sheets for all study intersections.

2 The existing volumes at this key intersection warrants the installation of a traffic signal (see Appendix B of the Traffic Impact Analysis Report for warrant sheet).

Table 4.9.C: Level of Service Criteria for Signalized Intersections[1]

Level of Service (LOS)	Intersection Capacity Utilization Value (V/C)	Level of Service Description
A	0.00–0.60	Free Flow; very low delay, less than 5.0 seconds per vehicle.
B	0.61–0.70	Rural Design; delay in the range of 5.1 to 15 seconds per vehicle.
C	0.71–0.80	Urban Design; delay in the range of 15.1 to 25 seconds per vehicle.
D	0.81–0.90	Maximum Urban Design; delay ranges from 25.1 to 40 seconds per vehicle.
E	0.91–1.00	Capacity; delay ranges from 40.1 to 60 seconds per vehicle.
F	≥ 1.01	Forced Flow; delay in excess of 60 seconds per vehicles.

In addition to the ICU method of analysis, the 2000 Highway Capacity Manual (HCM) unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized key study intersections. This methodology estimates the average control delay for each of the subject movements and determines the level of service for each movement. The overall average control delay measured in seconds per vehicle, and level of service, is then calculated for the entire intersection. The HCM control delay value translates to a LOS estimate. The six qualitative LOS categories have been defined along with the corresponding HCM control delay value range, as shown in Table 4.9.D.

Table 4.9.D: Level of Service Criteria for Unsignalized Intersections[2]

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

Traffic Forecasting Methodology

In order to estimate the traffic impact characteristics of the proposed Long Beach Sports Park project, a multi-step process was utilized. The first step is trip generation, which estimates the total arriving and departing traffic on a peak-hour and daily basis. The traffic generation potential is forecast by

[1] Refer to Appendix C of the Traffic Impact Analysis Report for detailed explanation of the ICU methodology and LOS Concept.

[2] Source: *Highway Capacity Manual 2000*, Chapter 17 (Unsignalized Intersections).

applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The traditional focus of traffic studies is weekday traffic conditions, especially the morning and evening peak commuter hours. However, the proposed project has the potential to generate a significant amount of traffic on the weekend, and especially on Saturdays when sports tournaments are scheduled. On that basis, the trip forecasting for the Long Beach Sports Park and detailed intersection capacity analyses looks at both periods.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the impact of the proposed project is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecasted project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated and the significance of the project's impacts identified.

The following scenarios are those for which volume/capacity calculations have been performed at the key intersections for the 2006 horizon year conditions:

1. 2002: Existing Traffic Conditions (presented above)
2. 2006: Future Background (Existing plus Ambient Growth to horizon year 2006 at 2.0 percent per year plus cumulative projects)
3. 2006 Future Background plus the proposed project formate
4. Scenario (3) with planned area improvements and/or project-specific mitigation, if necessary

Traffic generation is expressed in vehicle trip ends, defined as one-way movements, either entering or exiting the generating land use. The trip generation potential of the proposed Youth Golf Center was estimated using ITE Land Use Code 430: Golf Course and ITE Land Use Code 432: Golf Driving Range; ITE Land Use Code 710: General Office Building, was used to forecast the trip generation potential of the 30,000 sf commercial center component of the project.

Since there are no known published rates for a "skate park," trip rates that were developed based on trip generation studies of "similar uses" were utilized. The trip generation potential for the proposed sports park athletic fields and courts was estimated based on the expected attendance figures, and daily league and weekend tournament schedules.

The traffic report analyzes existing and future weekday p.m. peak-hour traffic conditions, and weekend (Saturday) midday peak-hour traffic conditions for a near-term (Year 2006) traffic setting upon opening of the Long Beach Sports Park. Peak-hour traffic forecasts for the Year 2006 horizon year have been projected by increasing existing traffic volumes by an annual growth rate of 2.0 percent per year and adding traffic volumes generated by 44 related projects.

Information concerning cumulative projects (planned and/or approved) in the vicinity of the project has been researched at the Cities of Long Beach and Signal Hill. There are 44 planned and/or approved related projects within the study area—34 in the City of Long Beach and 10 in the City of Signal Hill.

4.9.4 THRESHOLDS OF SIGNIFICANCE CRITERIA

As previously stated, 18 key intersection were selected for evaluation based on discussions with the City of Long Beach and the City of Signal Hill and in consideration of the criteria in the current County of Los Angeles CMP traffic impact guidelines. These intersections are located in the Cities of Long Beach or Signal Hill or are intersections shared by the two. More specifically, five of the selected intersections are located in the City of Long Beach, six in the City of Signal Hill, and seven are intersections shared by the two Cities. The significance of the potential impacts of the proposed project at each key intersection was evaluated using City of Long Beach standards and the Los Angeles County CMP traffic impact criteria. Impacts to local and regional transportation systems are considered significant if:

- an undesirable peak-hour level of service (i.e., LOS E or LOS F) at any of the key intersections is projected and the project increases traffic demand at the key signalized study intersection by 2 percent of capacity (ICU increase ≥ 0.02), causing or worsening LOS E or LOS F (ICU > 0.90). The Cities of Long Beach and Signal Hill consider LOS D (ICU = 0.18 – 0.90) to be the minimum acceptable LOS. For the City of Long Beach, the current LOS, if worse than D (i.e., LOS E or F) should also be maintained. At unsignalized intersections, a significant adverse traffic impact is defined as a project that: adds 2 percent or more traffic to delay (seconds per vehicle) at an intersection operating at LOS E or LOS F.
- the project results in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- the project substantially increases hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- the project results in inadequate emergency access.
- the project results in inadequate parking capacity.
- the project conflicts with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

4.9.5 IMPACTS AND MITIGATION MEASURES

Project Trip Generation and Distribution

As explained in the Methodology section above, trip generation represents the amount of traffic attracted and produced (i.e., generated) by a development. On a "typical" weekday, the proposed

project is forecast to generate 3,970 daily trips, with 687 trips, (459 entering and 228 exiting) produced during the p.m. peak commute hour. During a "typical" weekend day (Saturday) when tournaments are scheduled, the project is expected to generate 7,240 daily trips, with 798 trips (421 entering and 377 exiting) generated during the midday peak hour. The project traffic generation forecast is shown in Table 4.9.E.

Table 4.9.E: Project Traffic Generation Forecast[1]

ITE Land Use Code/ Project Description	Weekday				Weekend Day (Saturday)			
	Daily	PM Peak Hour			Daily	Midday Peak Hour		
	2-Way	In	Out	Total	2-Way	In	Out	Total
Generation Rates								
• 430: Golf Course (TE/holes)	35.74	1.21	1.53	2.74	40.63	2.25	2.34	4.59
• 432: Golf Driving Range (TE/hitting position)[2]	14.00	0.53	0.73	1.26	8.90	0.43	0.37	0.80
• 710: General Office[1] (TE/1,000 sf)	17.55	0.64	3.12	3.76	2.75	0.26	0.22	0.47
• Skate Park[2] (TE/1,000 sf)	15.76	1.46	0.90	2.36	24.09	1.28	1.13	2.41
• Long Beach Sport Park Athletic Fields[3]	—	—	—	—	—	—	—	—
Youth Golf Center								
• Youth Golf Center (8 tees & 3 holes)	250	8	10	18	190	10	10	20
Commercial Use								
• Office Building (30,000 sf)	530	19	94	113	80	8	7	15
Sports Park								
• Athletic Fields, Courts, and Batting Cages	2,830	398	103	501	6,410	374	334	708
• Skate Park (23,000 sf)	360	34	21	55	560	29	26	55
Subtotal	3,190	432	124	556	6,970	403	360	763
Long Beach Sports Park Total Trip Generation	**3,970**	**459**	**228**	**687**	**7,240**	**421**	**377**	**798**

1 Source: *Trip Generation*, 6th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (1997).
2 Daily trip rates based on information published in SANDAG *Traffic Generators*.
1 Source: The weekday and weekend trip generation rates for general office were calculated based on the equations per *Trip Generation*, 6th Edition. Weekday Daily Trips: Ln (T) = 0.7681Ln (X) + 3.654, Weekday PM Peak Hr: T = 1.121(X) + 79.295. Weekend Daily Trips: T = 2.136 (X) + 18.473, Saturday Peak Hour: LN (T) = 0.814 Ln(X) – 0.115
2 Source: Trip generation study of the existing Laguna Niguel Skate Park located on Alicia Parkway north of Aliso Creek Road in the City of Laguna Niguel conducted by LLG Engineers in May 2003.
3 Project traffic generation forecast for the Sports Park is based on expected attendance figures, weekday league play, and weekend tournament schedules, a weekday AVR of 1.25 persons per vehicle, and a weekend AVR of 1.5 persons per vehicles. See Appendix D of the Traffic Impact Analysis Report for detailed trip generation calculations.

The trip generation potential for the project was calculated assuming an average vehicle ridership (AVR) of 1.25 persons per vehicle for the weekday scenario and 1.50 persons per vehicle for the weekend condition. This accounts for participants who may walk, bike, or carpool to the park, as well as coaches, referees, and spectators who will do the same (carpool). The higher weekend AVR reflects that many trip origins will come from home, with families, couples, and friends carpooling on the weekend. The AVR used in the traffic analysis is likely a conservative assumption for trip generation purposes, since information provided by several sports park operators (Long Beach Department of Parks, Recreation, and Marine and Big League Dreams) indicates that the observed AVR at sites similar to the proposed project is approximately 1.7 persons per vehicle.

The distribution represents the directional orientation of traffic to and from the project site. Trip distribution is influenced by a variety of factors, including geographical location of the project site, the type of land use, access to the regional freeway and transportation system, and other planned uses in the area. The general distribution pattern for the proposed project is outlined in Table 4.9.F.

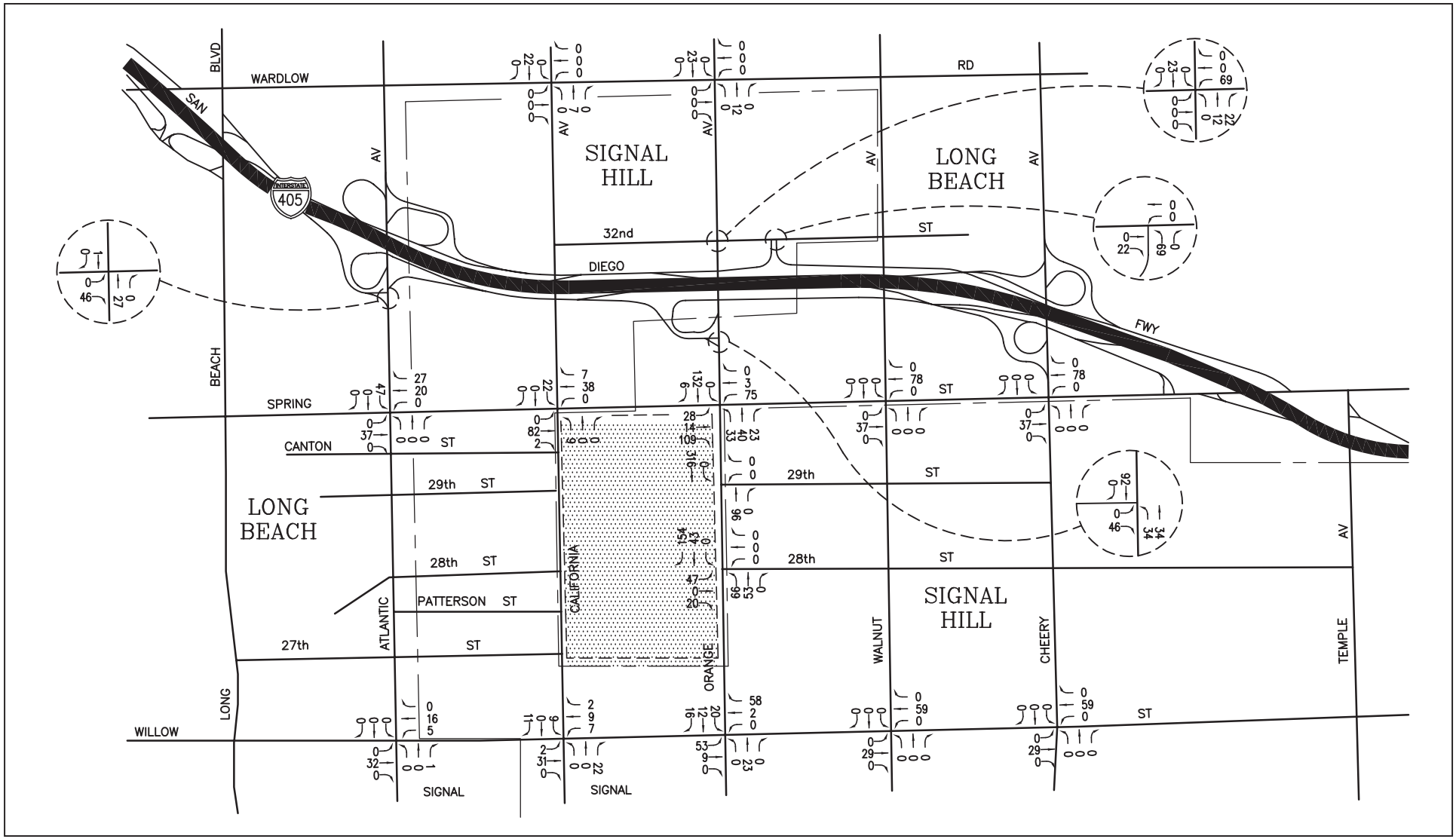
Table 4.9.F: Project Directional Distribution Pattern

Distribution Percentage	Orientation
20%	To/from the north via the I-405 Freeway
20%	To/from the south via the I-405 Freeway
25%	To/from the east via Spring Street and Willow Street
15%	To/from the west via Spring Street and Willow Street
10%	To/from the north via California Avenue and Orange Avenue
10%	To/from the south via California Avenue and Orange Avenue
100%	TOTAL

Project traffic volumes in and out of the site have been distributed and assigned to the adjacent street system based upon the following considerations: (1) the site's proximity to major traffic carriers (e.g., I-405, Atlantic Avenue, Cherry Avenue, Spring Street, Willow Street, etc.); (2) expected localized traffic flow patterns based on adjacent street channelization and presence of traffic signals; (3) ingress/egress availability at the project site; and (4) input from City staff.

The anticipated weekday p.m. peak-hour traffic volumes and weekend midday peak-hour project traffic volumes associated with the proposed project are presented in Figures 4.9.4 and 4.9.5, respectively. The anticipated weekday p.m. peak-hour and weekend midday peak-hour volumes at the project driveways are presented in Figures 4.9.6 and 4.9.7, respectively.

The daily project traffic volumes on the 13 key roadway segments surrounding the site for a "typical" weekday and Saturday are shown in Figure 4.9.8. The traffic volume assignments presented in Figures 4.9.4 through 4.9.8 reflect the general distribution pattern presented in Table 4.9.F, and the traffic generation forecast presented in Table 4.9.E.



LSA

FIGURE 4.9.4

Long Beach Sports Park

Weekday PM Peak Hour
Project Traffic Volumes

SOURCE: Linscott, Law & Greenspan.

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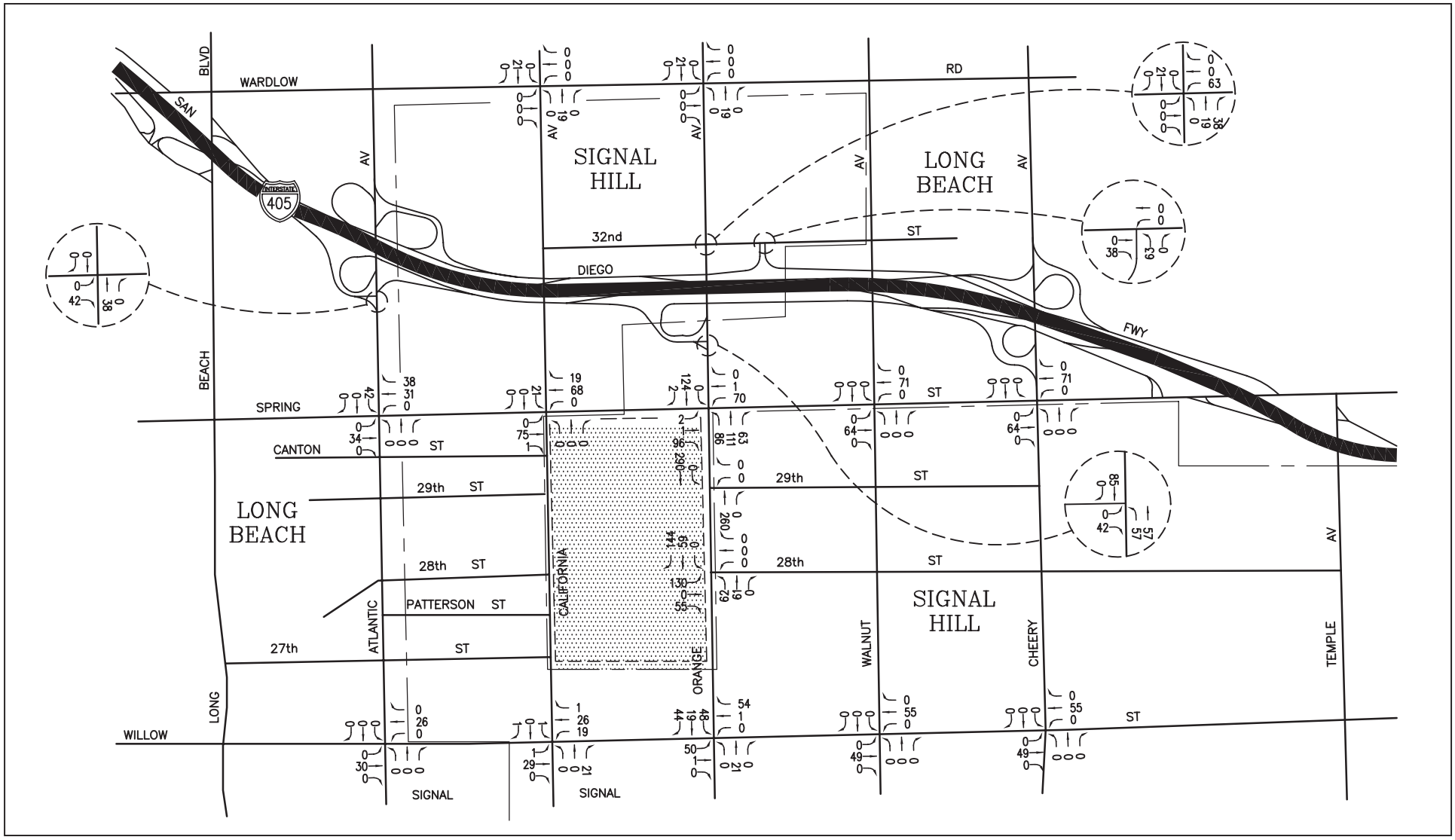

LSA

FIGURE 4.9.5

Long Beach Sports Park
Weekend Day Noon Peak Hour
Project Traffic Volumes

SOURCE: Linscott, Law & Greenspan.

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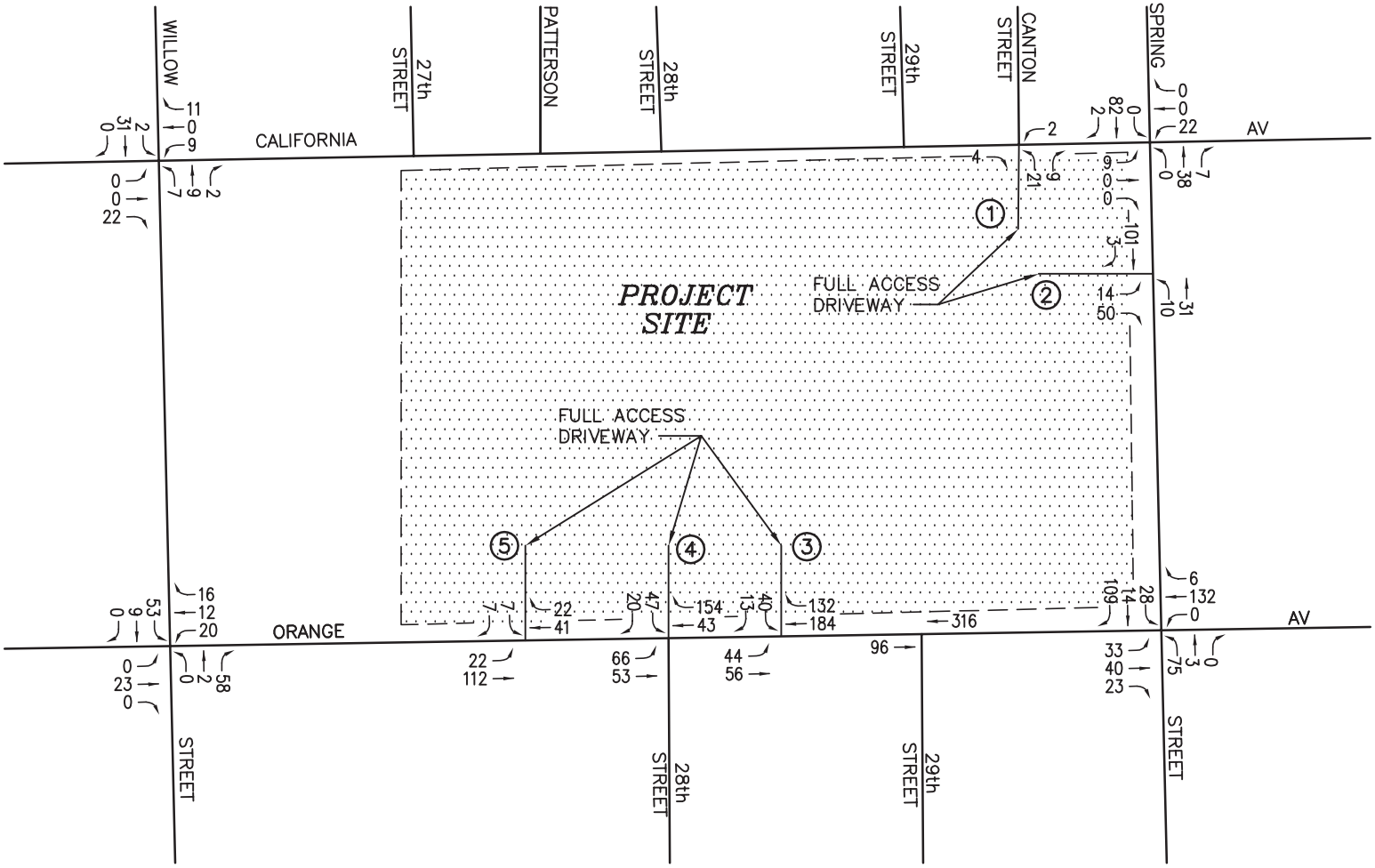

LSA

FIGURE 4.9.6

KEY

PROJECT SITE

Long Beach Sports Park

Weekday PM Peak Hour
Project Driveway Traffic Volumes

SOURCE: Linscott, Law & Greenspan.

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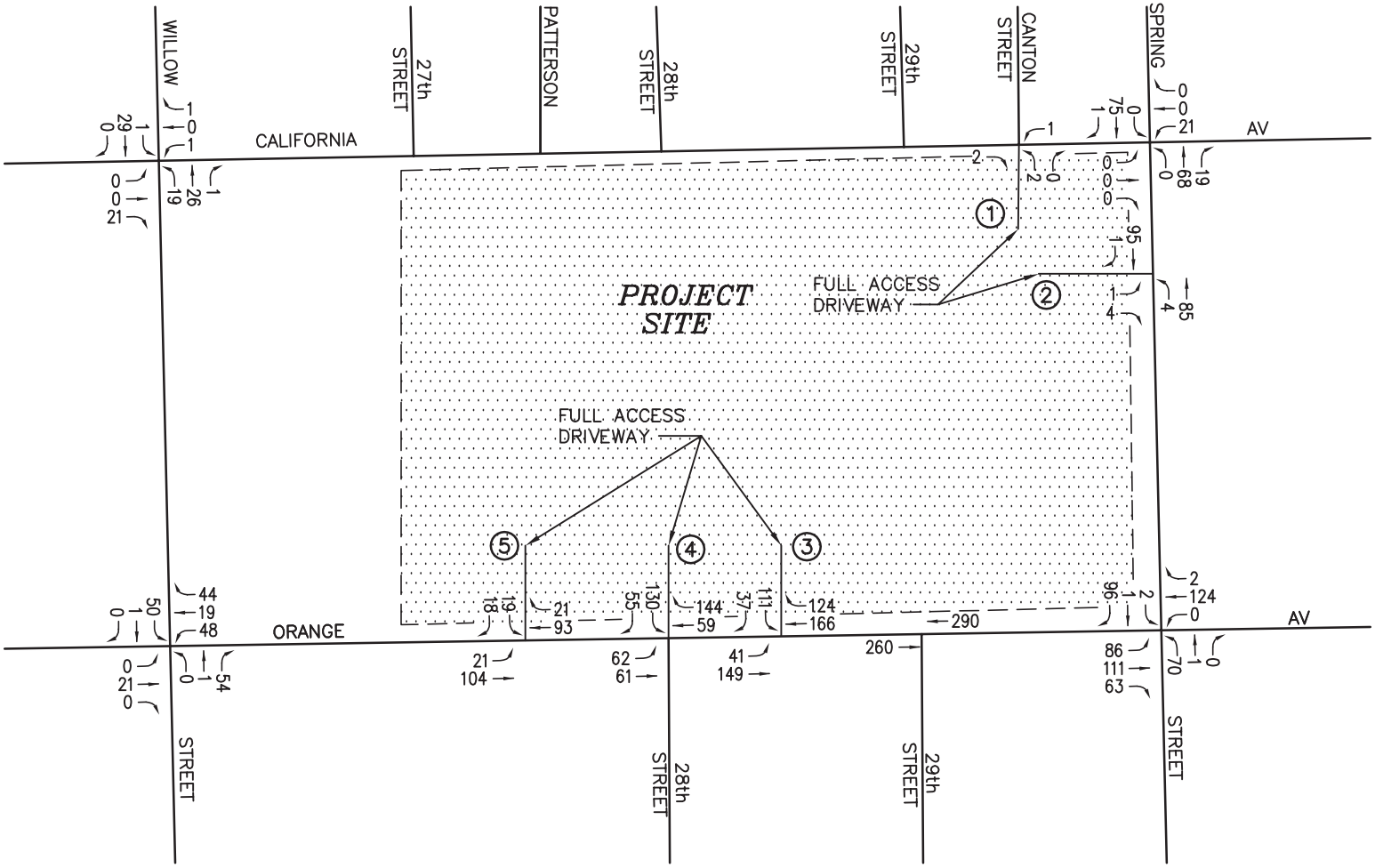

LSA

FIGURE 4.9.7

KEY

PROJECT SITE

N

Long Beach Sports Park

Weekend Day Noon Peak Hour
Project Driveway Traffic Volumes

SOURCE: Linscott, Law & Greenspan.

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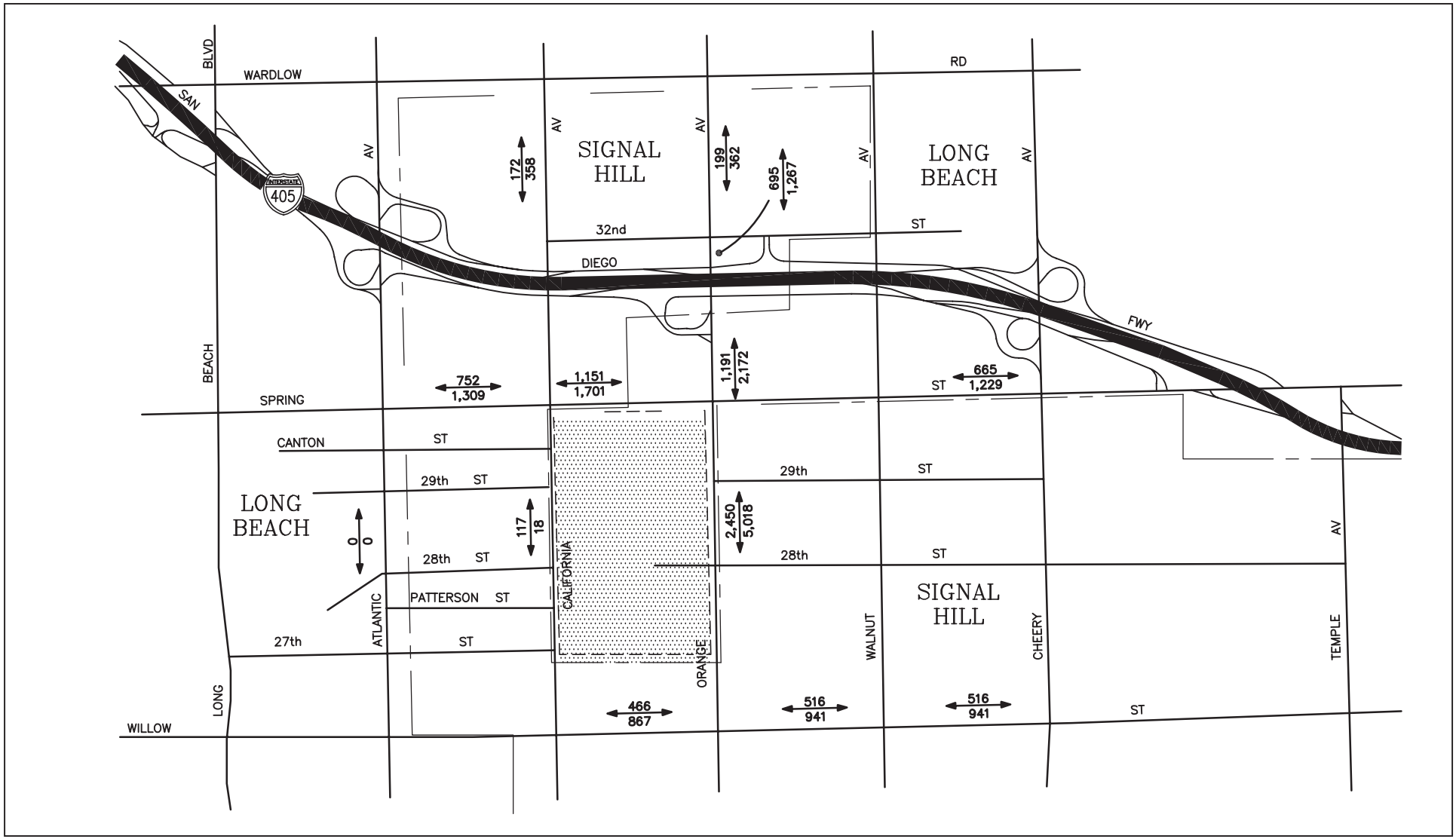

LSA

FIGURE 4.9.8

KEY

X,XXX / X,XXX = THURSDAY DAILY TRAFFIC VOLUMES / SATURDAY DAILY TRAFFIC VOLUMES

= PROJECT SITE

N

Long Beach Sports Park

Project Weekday and Weekend Day Daily Traffic Volumes

SOURCE: Linscott, Law & Greenspan.

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Ambient Traffic Growth. Horizon year (2006) background traffic growth estimates were calculated using growth factors recommended for use in the LA County CMP guidelines. The ambient growth factor is intended to include unknown and future related projects (refer to Table 4.9.K) in the study area, as well as account for regional growth outside the study area. Ambient traffic growth was calculated at 2 percent per year. The application of this growth rate to existing 2002 traffic volumes results in an 8 percent growth in existing volumes at the 18 study intersections to horizon year 2006.

Peak-Hour Intersection Capacity Analysis

Year 2006 Future Background Traffic Conditions.

Weekday Traffic Conditions. Table 4.9.G summarizes the p.m. peak-hour LOS results at the 18 key study intersections during a "typical" weekday for the Year 2006. The first column of ICU/LOS values in Table 4.9.G presents a summary of existing p.m. peak-hour traffic conditions (which were also presented in Table 4.9.A). The second column lists forecasted 2006 background conditions (existing plus ambient growth plus cumulative project traffic) based on existing intersection geometry, but without any traffic generated from the proposed project.

An analysis of future (Year 2006) background traffic conditions indicates that the addition of ambient traffic growth and cumulative project traffic will adversely impact 9 of the 18 key study intersections. The intersections of Atlantic Avenue at Willow Avenue, Cherry Avenue at Willow Street, Atlantic Avenue at Spring Street, and Cherry Avenue at Spring Street, as well as the I-405 SB off-ramp approach at Orange Avenue, are forecast to deteriorate one service level and operate at LOS F during the weekday p.m. peak commute hour. The intersections of Orange Avenue at Willow Street, Orange Avenue at Spring Street, 32nd Street at Orange Avenue, and California Avenue at Wardlow Road are forecast to operate at LOS E in the Year 2006 background condition during the p.m. peak hour with the addition of ambient traffic and related projects traffic. The remaining nine key study intersections are forecast to operate at LOS D or better during the weekday p.m. peak hour.

Weekend Day (Saturday) Traffic Conditions. As stated earlier, the traditional focus of traffic impact studies is weekday traffic conditions, especially the p.m. peak commuter hours when traffic volumes are greatest. Further, intersection and roadway improvements are typically recommended/identified to offset a project's weekday peak-hour impact and ensure acceptable service levels throughout the week (Monday through Friday). However, since the proposed project has the potential to generate a significant amount of traffic on the weekend, and especially on Saturdays during scheduled sports tournaments, a weekend analysis was prepared.

Table 4.9.H summarizes the midday peak-hour LOS results at the 18 key study intersections during a "typical" weekend day for the Year 2006. The structure of this table is similar to the weekday capacity analysis presented in Table 4.9.G.

An analysis of horizon year (2006) background traffic conditions indicates that the addition of ambient traffic growth and cumulative project traffic will adversely impact 1 of the 18 key study intersections. Although the unsignalized intersection of the I-405 SB ramps at Orange Avenue

Table 4.9.G: Year 2006 Intersection Capacity Analysis Weekday PM Peak Commute Hour ICU/LOS Summary

Key Intersections		(1) Year 2002 Existing Traffic Conditions		(2) Year 2006 Background Traffic Conditions		(3) Year 2006 Traffic Conditions with Project Traffic		(4) Project Impact/ Significance		(5) Future Conditions With Mitigation	
		ICU	LOS	ICU	LOS	ICU	LOS	ICU Inc.	Y/N	ICU	LOS
1.	Atlantic Avenue at Willow Street	**0.956**	**E**	**1.083**	**F**	**1.094**	**F**	0.011	No	—	—
2.	California Avenue at Willow Street	0.782	C	0.871	D	0.896	D	0.025	No	—	—
3.	Orange Avenue at Willow Street	0.807	D	**0.901**	**E**	**0.910**	**E**	0.009	No	—	—
4.	Walnut Avenue at Willow Street	0.740	C	0.814	D	0.820	D	0.006	No	—	—
5.	Cherry Avenue at Willow Street	**0.946**	**E**	**1.075**	**F**	**1.081**	**F**	0.006	No	—	—
6.	Orange Avenue at 28th Street	1.34 sec/veh LOS A		1.41 sec/veh LOS A		3.41 sec/veh LOS A		2.00 s/v	No	0.517	A[1]
	• Minor Approach Delay/LOS	15.1 sec/veh LOS C		17.5 sec/veh LOS C		**61.8 sec/veh LOS F**		**44.3 s/v**	**Yes**	—	A[1]
7.	Orange Avenue at 29th Street	1.16 sec/veh LOS A		1.23 sec/veh LOS A		0.86 sec/veh LOS A		0.00 s/v	No	—	—
	• Minor Approach Delay/LOS	14.3 sec/veh LOS B		16.3 sec/veh LOS C		14.1 sec/veh LOS B		0.00 s/v	No	—	—
8.	Atlantic Avenue at Spring Street	**0.913**	**E**	**1.020**	**F[2]**	**1.060**	**F**	**0.040**	**Yes**	1.004	F[3]
9.	California Avenue at Spring Street	0.542	A	0.696	B[2]	0.727	C	0.031	No	—	—

[1] Represents anticipated LOS with installation of a traffic signal.
[2] Represents forecast LOS with completion of the Spring Street Widening Project improvements.
[3] Represents anticipated LOS with construction of a separate northbound right-turn lane on Atlantic Avenue at Spring Street, recommended to mitigate the impact of Long Beach Sports Park project traffic.

Table 4.9.G: Year 2006 Intersection Capacity Analysis Weekday PM Peak Commute Hour ICU/LOS Summary (continued)

Key Intersections		(1) Year 2002 Existing Traffic Conditions		(2) Year 2006 Background Traffic Conditions		(3) Year 2006 Traffic Conditions with Project Traffic		(4) Project Impact/ Significance		(5) Future Conditions With Mitigation	
		ICU	**LOS**	**ICU**	**LOS**	**ICU**	**LOS**	**ICU Inc.**	**Y/N**	**ICU**	**LOS**
10.	Orange Avenue at Spring Street	0.751	**C**	**0.908**	**E**	**1.064**		**0.156**	**Yes**	0.871	D[1]
11.	Walnut Avenue at Spring Street	0.660	B	0.747	C	0.759	C	0.012	No	—	—
12.	Cherry Avenue at Spring Street	**0.942**	**E**	**1.045**	**F**	**1.045**	**F**	0.000	No	—	—
13.	I-405 SB ramps at Orange Avenue	10.28 sec/veh LOS B		21.29 sec/veh LOS C		**36.36 sec/veh LOS E**		**15.07 s/v**	**Yes**	0.567	A[2]
	• Minor Approach Delay/LOS	**100.6 sec/veh LOS F**		**246.5 sec/veh LOS F**		**480.2 sec/veh LOS F**		**233.7 s/v**	**Yes**	—	A[2]
14.	32nd Street at Orange Avenue	0.796	C	**0.916**	**E**	**0.981**	**E**	**0.065**	**Yes**	NF[3]	—
15.	I-405 NB ramps at 32nd Street	8.17 sec/veh LOS A		10.24 sec/veh LOS B		13.17 sec/veh LOS B		2.93 s/v	No	—	—
	• Minor Approach Delay/LOS	14.2 sec/veh LOS B		17.4 sec/veh LOS C		21.8 sec/veh LOS C		4.4 s/v	No	—	—
16.	Atlantic Avenue at I-405 SB ramps	0.699	B	0.856	D	0.894	D	0.038	No	—	—
17.	Orange Avenue at Wardlow Road	0.524	A	0.585	A	0.589	A	0.004	No	—	—
18.	California Avenue at Wardlow Road	0.864	D	**0.962**	**E**	**0.969**	**E**	0.007	No	—	—

1 Represents anticipated LOS with conversion of a southbound right-turn lane on Orange Avenue at Spring Street to a shared through/right-turn lane and a separate eastbound right-turn lane, recommended to mitigate the impact of Long Beach Sports Park project traffic.

2 Represents anticipated LOS with installation of a traffic signal, which is warranted under existing traffic conditions.

3 NF = None Feasible. Intersection capacity improvements at this key intersection are not feasible due to physical and right-of-way constraints. However, traffic systems management improvements (e.g. a signal upgrade) reduce overall intersection delay to pre-project levels.

Table 4.9.H: Year 2006 Intersection Capacity Analysis (Saturday) Midday Peak Community House ICU/LOS Summary

Key Intersections		(1) Year 2002 Existing Traffic Conditions		(2) Year 2006 Background Traffic Conditions		(3) Year 2006 Traffic Conditions with Project Traffic		(4) Project Impact/ Significance		(5) Future Conditions With Mitigation	
		ICU	LOS	ICU	LOS	ICU	LOS	ICU Inc.	Y/N	ICU	LOS
1.	Atlantic Avenue at Willow Street	0.723	C	0.834	D	0.841	D	0.007	No	—	—
2.	California Avenue at Willow Street	0.458	A	0.525	A	0.556	A	0.031	No	—	—
3.	Orange Avenue at Willow Street	0.639	B	0.725	C	0.785	C	0.060	No	—	—
4.	Walnut Avenue at Willow Street	0.421	A	0.458	A	0.468	A	0.010	No	—	—
5.	Cherry Avenue at Willow Street	0.769	C	0.866	D	0.876	D	0.010	No	—	—
6.	Orange Avenue at 28th Street	0.36 sec/veh LOS A		0.33 sec/veh LOS A		4.95 sec/veh LOS A		4.62 s/v	No	0.463	A[1]
	• Minor Approach Delay/LOS	11.1 sec/veh LOS B		12.1 sec/veh LOS B		**39.5 sec/veh LOS E**		**27.4 s/v**	**Yes**	—	A[1]
7.	Orange Avenue at 29th Street	0.15 sec/veh LOS A		0.15 sec/veh LOS A		0.11 sec/veh LOS A		0.00 s/v	No	—	—
	• Minor Approach Delay/LOS	13.5 sec/veh LOS B		15.4 sec/veh LOS C		18.9 sec/veh LOS C		3.50 s/v	No	—	—
8.	Atlantic Avenue at Spring Street	0.529	A	0.654	B[2]	0.690	B	0.036	No	0.671	B[3]
9.	California Avenue at Spring Street	0.260	A	0.415	A[2]	0.456	A	0.041	No	—	—
10.	Orange Avenue at Spring Street	0.476	A	0.630	B	0.768	C	0.138	No	0.630	B[4]
11.	Walnut Avenue at Spring Street	0.277	A	0.349	A	0.372	A	0.023	No	—	—

1 Represents anticipated LOS with installation of a traffic signal.
2 Represents forecasted LOS with completion of the Spring Street Widening Project improvements.
3 Represents anticipated LOS with construction of a separate northbound right-turn lane on Atlantic Avenue at Spring Street, recommended to mitigate the impact of Long Beach Sports Park project traffic.
4 Represents anticipated LOS with conversion of a southbound right-turn lane on Orange Avenue at Spring Street to a shared through/right-turn lane and a separate eastbound right-turn lane, recommended to mitigate the impact of Long Beach Sports Park project traffic.

Table 4.9.H: Year 2006 Intersection Capacity Analysis (Saturday) Midday Peak Community House ICU/LOS Summary (continued)

Key Intersections		(1) Year 2002 Existing Traffic Conditions		(2) Year 2006 Background Traffic Conditions		(3) Year 2006 Traffic Conditions with Project Traffic		(4) Project Impact/ Significance		(5) Future Conditions With Mitigation	
		ICU	LOS	ICU	LOS	ICU	LOS	ICU Inc.	Y/N	ICU	LOS
12.	Cherry Avenue at Spring Street	0.636	B	0.713	C	0.713	C	0.000	No	—	—
13.	I-405 SB ramps at Orange Avenue	3.65 sec/veh LOS A		4.60 sec/veh LOS A		7.62 sec/veh LOS A		3.02 s/v	No	0.477	A[1]
	• Minor Approach Delay/LOS	23.4 sec/veh LOS C		**35.9 sec/veh LOS E**		**79.9 sec/veh LOS F**		**40.0 s/v**	**Yes**	—	A[1]
14.	32nd Street at Orange Avenue	0.572	A	0.703	C	0.778	C	0.075	No	0.724	C[2]
15.	I-405 NB ramps at 32nd Street	5.34 sec/veh LOS A		6.75 sec/veh LOS A		7.71 sec/veh LOS A		0.96 s/v	No	—	—
	• Minor Approach Delay/LOS	10.8 sec/veh LOS B		12.3 sec/veh LOS B		13.8 sec/veh LOS B		1.5 s/v	No	—	—
16.	Atlantic Avenue at I-405 SB ramps	0.597	A	0.718	C	0.730	C	0.012	No	—	—
17.	California Avenue at Wardlow Road	0.277	A	0.327	A	0.338	A	0.011	No	—	—
18.	Orange Avenue at Wardlow Road	0.564	A	0.646	B	0.660	B	0.014	No	—	—

[1] Represents anticipated LOS with installation of a traffic signal, which is warranted under existing traffic conditions.
[2] Represents anticipated LOS with construction of a separate northbound right-turn lane on Orange Avenue at 32nd Street, recommended to mitigate the impact of Long Beach Sports Park project traffic.

operates at LOS A during the weekend day midday peak hour, the minor street (I-405 SB off-ramp) approach is forecast to operate at LOS E with the addition of ambient traffic and related projects traffic. The remaining 17 key study intersections are forecast to operate at LOS D or better during the weekend day midday peak hour.

Year 2006 Future Background Traffic Conditions with Project Traffic

Weekday Traffic Conditions. The third column in Table 4.9.G presents future forecast traffic conditions with the addition of traffic generated by the proposed project. The fourth column shows the increase in ICU value due to added project trips and indicates whether the traffic associated with the project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

The fifth column of Table 4.9.G presents the forecast levels of service for the p.m. peak commute hour with the implementation of mitigation measures, recommended to achieve/maintain an acceptable level of service and/or off-set the significant impact of project-related traffic.

Review of columns 3 and 4 of Table 4.9.G shows that traffic generated by the proposed project will have a significant impact at the following five study intersections identified below when compared to the LOS standards and significant impact criteria specified in this report.

Key Intersection		City/Jurisdiction	PM Peak Hour LOS
6.	Orange Avenue at 28th Street	Long Beach/Signal Hill	61.8 s/v / F
8.	Atlantic Avenue at Spring Street	Long Beach	1.060 / F
10.	Orange Avenue at Spring Street	Signal Hill	1.064 / F
13.	I-405 SB ramps at Orange Avenue	Long Beach/Caltrans	480.2 s/v / F
14.	32nd Street at Orange Avenue	Signal Hill	0.981 / E

As mentioned earlier, the City of Long Beach significance criteria dictate that a significant project impact occurs when the project increases traffic demand at a study intersection by 0.020, resulting in an unacceptable LOS (E or F) or a worsening adverse LOS condition. The proposed project cumulatively impacts the intersections of Atlantic Avenue at Spring Street, Orange Avenue at Spring Street, and 32nd Street at Orange Avenue, causing further deterioration of the intersections' existing service levels. As a result of added project traffic, these three intersections experience significant ICU increases of 0.040, 0.156, and 0.065 respectively. Mitigation Measures 4.9.2 and 4.9.3 have been included to reduce potential impacts to the Atlantic Avenue/ Spring Street and Orange Avenue/Spring Street intersections to a less than significant level. Due to physical and right-of-way restrictions that prohibit any widening or restriping at the 32nd Street/Orange Avenue intersection, intersection capacity improvements at this key intersection do not appear to be feasible. As the following table shows, however, installation of an actuated signal will reduce the overall intersection delay (compare columns 2 and 3) during the critical weekday p.m. peak-hour to preproject levels (compare columns 1 and 3). Although installation of the signal is a traffic system management improvement rather than an intersection capacity improvement, implementation of Mitigation Measure 4.9.5 has been included to operationally reduce project impacts to the intersection of 32nd Street/Orange Avenue to a less than significant

level. As shown in Table 4.9.G, the three intersections operate at acceptable levels of service with implementation of the required mitigation.

Key Intersection	Time Period	(1) Year 2006 Background Traffic Conditions			(2) Year 2006 Traffic Conditions with Project Traffic			(3) Year 2006 Traffic Conditions with Project Traffic & Recommended Signal Operations Upgrade		
		Delay (sec/veh)	V/C Ratio	LOS	Delay (sec/veh)	V/C Ratio	LOS	Delay (sec/veh)	V/C Ratio	LOS
14. 32nd Street at Orange Avenue	Weekday PM Peak	54.4	0.99	D	80.0	1.08	E	51.6	1.07	D
	Weekend Noon Peak	16.7	0.67	B	26.5	0.76	C	15.9	0.80	B

Although the unsignalized intersection of Orange Avenue and 28th Street, overall, is forecast to operate at LOS A during the p.m. peak hour, the addition of project traffic directly impacts this intersection and will cause the minor street (28th Street/Project Driveway No. 3) approach to operate at LOS F. Mitigation Measure 4.9.6 reduces this impact to below a level of significance and is further discussed below under the heading Access and Circulation.

The addition of project traffic at Orange Avenue and the I-405 SB ramps cumulatively impacts this unsignalized intersection, causing the LOS F condition of the minor street (I-405 SB off-ramp) to further deteriorate. As shown in Table 4.9.G, implementation of Mitigation Measure 4.9.4 will reduce project traffic impacts at this intersection to a less than significant level.

The remaining 13 key study intersections will not be impacted by the proposed project based on the specified LOS standards and significance impact criteria.

A description of planned intersection improvements and mitigation measures is included below. The implementation of planned and/or recommended improvements at these seven study intersections reduces the impact of project traffic (see column 5 of Table 4.9.G) to a less than significant level.

Weekend Day (Saturday) Traffic Conditions. Review of columns 3 and 4 of Table 4.9.H shows that the proposed project will have a significant traffic impact at 2 of the 18 key study intersections. Although overall the unsignalized intersections of Orange Avenue/28th Street and the I-405 SB ramps/Orange Avenue are forecast to operate at LOS A during the weekend day midday peak hour, the addition of project traffic will cause the minor street approach to operate at LOS E and F, respectively. The remaining 16 key study intersections are projected to continue to operate at an acceptable service level with the inclusion of project traffic, during the weekend day, midday peak hour.

A description of planned intersection improvements and project mitigation measures is included below. As shown in the fifth column of Table 4.9.H, Mitigation Measures 4.9.4 and 4.9.7 will reduce project impacts related to weekend traffic conditions to a less than significant level.

Air Traffic

The proposed project site is not within the commercial aircraft flight path for Long Beach Airport, and it is not located within the Airport Safety Zone or the Airport's current adopted noise contours.

However, the airspace over the project site is used by helicopters and small aircraft. The northern boundary of the project site is approximately one mile west and one-eight mile south of the end of Runway 7R-25L and is subject to overflight by small general aviation aircraft arriving and departing on that runway. Runway 25L is the Airport's most heavily-used general aviation runway. Additionally, while no established helicopter routes into or out of the Airport transverse the site, there is helicopter traffic in the area along I-405 and other major arterials.

The proposed project should have no effect on the use this airspace; however, users of the park may be subject to occasional aircraft overflights at altitudes below 1,000 feet. While noise levels will be well below State and federal standards for aircraft noise, some users of the Sports Park and youth golf center may find this aircraft noise annoying. For additional discussion on noise impacts, please refer to Section 4.11 of this EIR.

Access and Internal Circulation

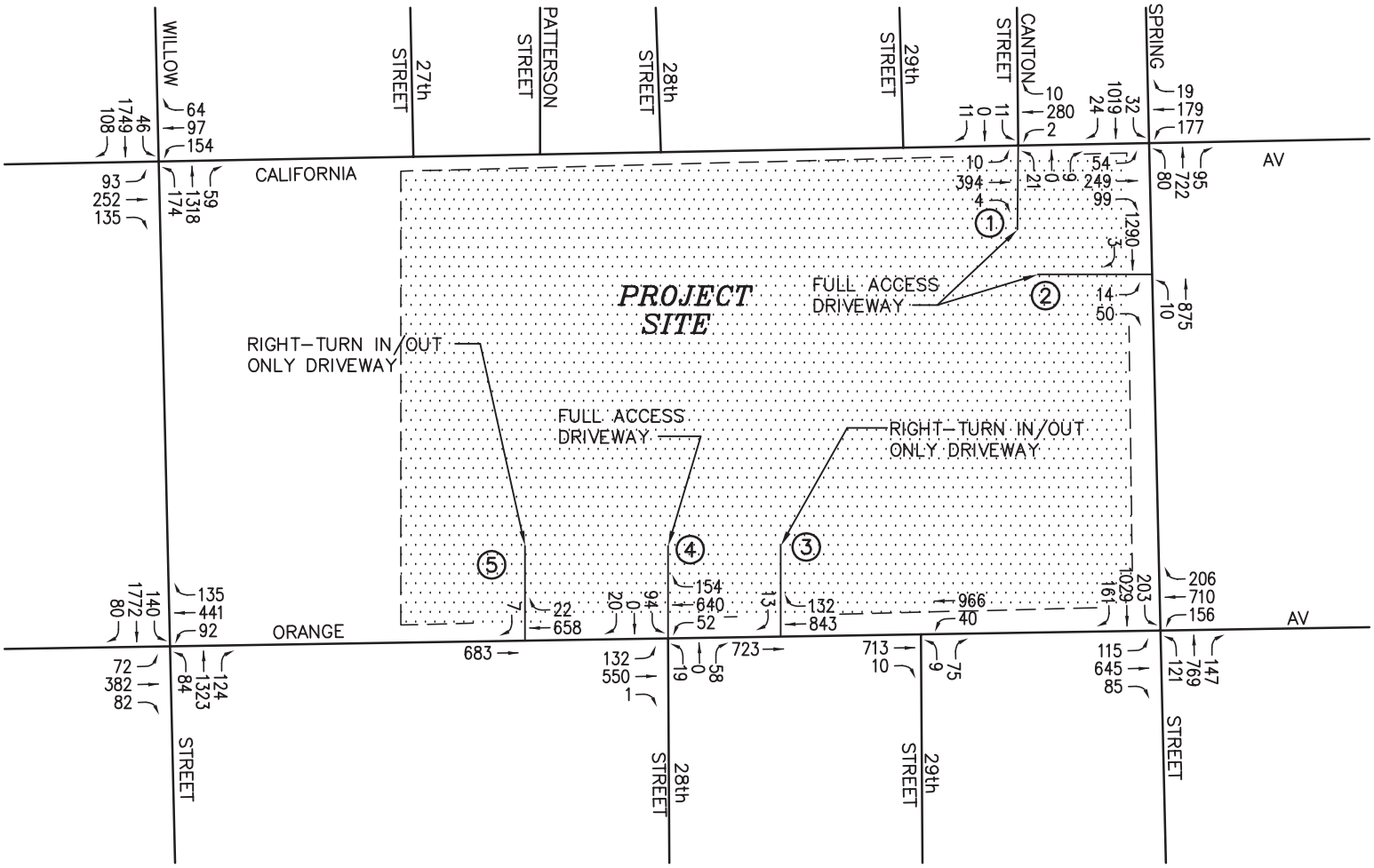
Access to the project site will be provided by a total of five full access driveways along California Avenue, Spring Street, and Orange Avenue (refer to Figure 3.5). All project driveways are proposed to be one-way stop controlled, except the main project entrance at Orange Avenue and 28th Street, which will be signalized (Mitigation Measure 4.9.7).

All five project driveways are forecast to operate at LOS A in the Year 2006 background condition with project traffic during the weekday p.m. peak hour and the weekend day midday peak hour. However, the minor approach of Project Driveway No. 3 is projected to operate at LOS E during the weekday p.m. peak hour and weekend day midday peak hour with delays of 35.7 seconds per vehicle and 41.1 seconds per vehicle, respectively. However, by restricting access at this driveway to "right-turns only" and re-routing left-turn project traffic at this location to Driveway No. 4 (Orange Avenue at 28th Street), as stipulated in Mitigation Measure 4.9.6, acceptable service levels are maintained on all approaches to this project access point.

Figures 4.9.9 and 4.9.10 show the alternative access traffic volumes (i.e., restricted access at Project Driveway No. 3) at the project driveways for the weekday p.m. peak hour and the weekend day midday peak hour, assuming the installation of a five-phase traffic signal at Project Driveway No. 4 (Orange Avenue at 28th Street) and assuming that Project Driveway Nos. 3 and 5 are restricted to "right turns only" (Mitigation Measures 4.9.6 and 4.9.7).

The minor approach of Project Driveway No. 4 (Orange Avenue at 28th Street) is projected to operate at LOS F during the weekday p.m. peak hour, with a delay of 61.8 seconds per vehicle, and at LOS E during the weekend day midday peak hour, with a delay of 39.5 seconds per vehicle.

To minimize delays for vehicles exiting the project site at Project Driveway No. 4 (Orange Avenue at 28th Street), a five-phase traffic signal with protected northbound and southbound left-turns along



LSA

FIGURE 4.9.9

Long Beach Sports Park

Year 2006 Weekday PM Peak Hour Driveway Traffic Volumes With Project Traffic - Alternative Access

SOURCE: Linscott, Law & Greenspan.

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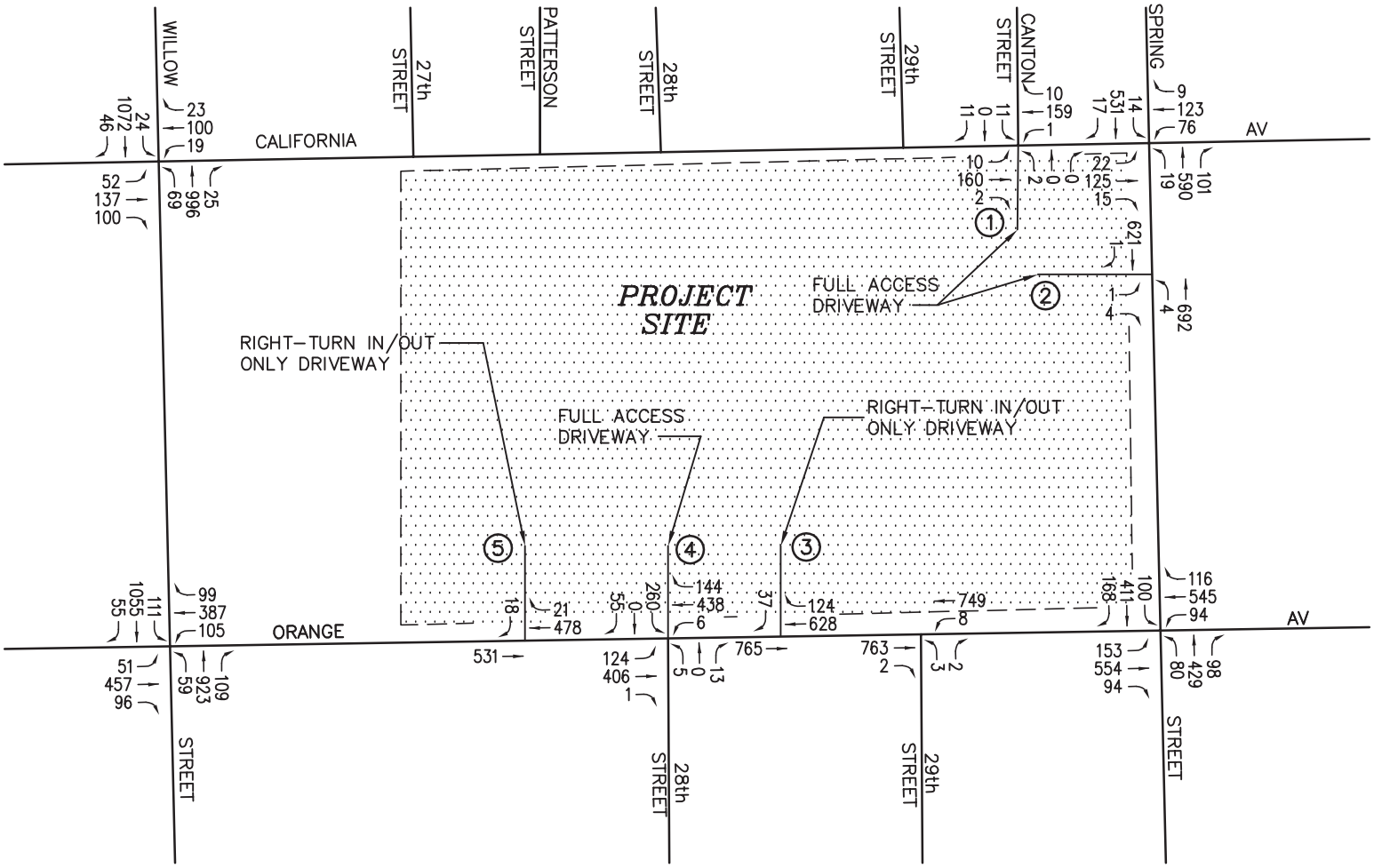

LSA

FIGURE 4.9.10

KEY

PROJECT SITE

N

Long Beach Sports Park

Year 2006 Weekend Day Noon Peak Hour Driveway Traffic Volumes With Project Traffic - Alternative Access

SOURCE: Linscott, Law & Greenspan.

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Orange Avenue is required at this location and has been included in the project description and as Mitigation Measure 4.9.7. Based on the results of a traffic signal warrant analysis, the Year 2006 traffic volumes with project traffic warrants the installation of a traffic signal at Driveway No. 4 (Orange Avenue at 28th Street). Implementation of this traffic signal will minimize vehicular delays for vehicles entering and exiting the project site and improve safety conditions at this project driveway. Project Driveway No. 4 (Orange Avenue at 28th Street) will operate at LOS A during the weekday p.m. peak hour and weekend day midday peak hour with the installation of a five-phase traffic signal.

The on-site circulation layout of the proposed project, on an overall basis, is adequate. Curb return radii have been confirmed and are adequate for small service/delivery (Fedex, UPS) trucks and trash trucks. Vehicle-turning templates (ASSHTO P_M and SU-30) have been used to ensure that passenger cars and trucks can properly access and circulate through the site. In addition, all internal drive aisle widths, project driveway widths, and parking stall widths satisfy the City's minimum requirements. The proposed throat lengths at the project driveways are sufficient for storing potential queuing vehicles.

Construction Traffic

Construction activities associated with the development of the project will include clearing and grubbing, demolition, excavation/grading, construction of drainage systems, roadways, and structures within the project site. Construction at the project site would occur five days per week (Monday through Friday) between the hours of 7:00 a.m. and 10:00 p.m.

The construction impacts that will result from the activities of equipment transport and construction and construction equipment operators will include a temporary increase in traffic activities during the construction phase of the project.

It is anticipated that demolition of the existing structures will take approximately six to eight weeks, beginning in 2005. Implementation of the proposed project will require approximately 638,440 cubic yards of cut and 625,998 cubic yards of fill. It is anticipated that the cut and fill will be balanced on site and the difference in these estimated volumes is intended to accommodate a minor amount of "shrinkage" that will occur when the on-site soils are converted to compacted fill. Equipment required would include four dozers working 10 hours per day during peak days, two pieces of crushing equipment and two loaders working eight hours a day each, and haul trucks and trailers making a total of 60 trips per day traveling 30 miles each way.

Grading and construction of the playing fields, parking lots, and building pads will take approximately four to five months. Equipment required would include two dozers working 10 hours per day during peak days, four scrapers working eight hours per day, haul trucks making a total of 40 trips per day traveling 30 miles each way, and four water trucks traveling 15 miles on site per day, as shown in Table 4.9.I. In addition, it is assumed there would be 30 workers on the site during demolition and 25 workers during grading, each traveling 40 miles per day to and from the site.

Table 4.9.I: Construction Equipment—Demolition and Grading

Source	Hours or Miles Per Day
Demolition	
2 Dozers	10 hours
2 Loaders	8 hours
2 Crushing Equip.	8 hours
2 Hydraulic Hammers, backhoe mounted	8 hours
2 Water Trucks	15 miles
60 Haul Truck Trips	30 miles each
30 Worker Trips	40 miles each
Grading	
2 Dozers	10 hours
4 Scrapers	8 hours
2 Water Trucks	15 miles
40 Haul Truck Trips	30 miles each
25 Worker Trips	40 miles each

Source: LSA Associates, Inc., March 2004.

Construction impacts are temporary during the period of construction, and the number of construction workers will vary depending on the specific construction activities over time. To reduce the impact of construction traffic, implementation of a construction management plan will be required to minimize traffic impacts upon the local circulation system in the area (Mitigation Measure 4.9.8).

Based on the location of the site, and the proximity of the I-405 Freeway, it is anticipated that a majority of the construction-related traffic will utilize the freeway to gain regional access to the site. Traffic impact to the adjacent roadway network will be minimal and not long-term.

Design Features

Sight distances at the project driveways appear to be adequate as California Avenue, Spring Street. and Orange Avenue are relatively straight (i.e., nominal horizontal curves). However, due to the vertical grades, a detailed sight distance analysis will be prepared for the project driveways, especially those along Orange Avenue, as part of the project's grading, landscape, and street improvement plans to ensure that safe access and egress is provided (Mitigation Measure 4.9.9). A vertical sight distance analysis for the project driveways was not performed since the vertical profiles of California Avenue and Orange Avenue adjacent to the project site were not available.

Because of potential sight distance restrictions/limitations due to the vertical alignment of Orange Avenue, restricting turning movements at Project Driveway Nos. 3 and 5 to "right turns only" would minimize safety concerns at these locations (Mitigation Measure 4.9.6).

The sight distance analysis should be prepared according to the Caltrans *Highway Design Manual* standards and guidelines, and indicate limited use areas (i.e., low-height landscaping), and on-street parking restrictions (i.e., red curb), if necessary.

Parking

To determine the number of parking spaces required to support the proposed Long Beach Sports Park project, parking demand was calculated using the City of Long Beach Zoning Code (recreation section, office section, and retail section).

The Zoning Code specifies a parking ratio of 1 space per tee and 3 spaces per hole for golf range and golf course facilities; 4 spaces per 1,000 square feet (sf) for retail uses; 1 space per 1,000 sf of gross land area (GLA) for open recreation facilities; 5 spaces per court for volleyball/arena soccer court; and 1 space per batting cage. For office uses, the Zoning Code requires 4 spaces per 1,000 gross floor area (GFA) of office/administrative uses up to 20,000 GFA, and 2 spaces per 1,000 GFA of office/administrative uses for GFAs of more than 20,000.

Table 4.9.J summarizes the parking requirements for the proposed project according to the Zoning Code. Application of Zoning Code parking ratios to the youth golf center uses and the Sports Park results in a total parking requirement of 899 spaces. With a proposed parking supply of 746 spaces, the Long Beach Sports Park will have a theoretical parking deficiency of 153 parking spaces.

The application of Zoning Code parking ratios to the commercial parcel (assumed to be a 30,000 SF office building) results in a total parking requirement of 100 parking spaces.

Analyzing the parking supply-demand relationships of the proposed Long Beach Sports Park involves determining the parking needs in relationship to the future parking area supply. The parking requirements for the sports complex vary, depending on the schedule of activities, number of participants, and anticipated number of spectators. Similar to the trip generation estimates prepared for the project, the peak parking demand forecast for the proposed Long Beach Sport Park sports facilities was also estimated based on the expected attendance figures and daily league and weekend tournament schedules.

During peak weekday operations, for which 770 players and spectators will be on-site during the peak hour, a total of 616 spaces will be required. This parking forecast is based on an average vehicle ridership of 1.25 persons per vehicle. This is to reflect that during the week, participants come from many different places (work, school, home, etc.) and thus do not rideshare as much.

When combined with a Zoning Code parking requirement of 77 spaces for the Youth Golf Facility, 23 spaces for the skate park, and 9 spaces for the batting cages, the Long Beach Sports Park is forecast to require a total of 725 parking spaces during weekdays (616 + 77 + 23 + 9 = 725 spaces). With a proposed parking supply of 746 spaces, a parking surplus of 21 spaces can be expected during peak weekday parking conditions.

A total of 625 spaces will be required to support the peak parking demand of the Long Beach Sports Park when sporting tournaments are scheduled on weekends (Saturdays). The weekend parking forecast is based on an average vehicle ridership of 1.5 persons per vehicle. This higher average

Table 4.9.J: Zoning Code Parking Requirements[1]

PROJECT DESCRIPTION/LAND USE	SIZE[2]	CITY OF LONG BEACH CODE PARKING RATIO	SPACES REQUIRED
Youth Golf Center			
Golf Range	8 Tees	1 Space per Tee	8
Golf Course (3 Holes)	3 Holes	3 Spaces per Hole	9
Club House	15,000 SF	4 Spaces per 1,000 SF	60
		Subtotal	*77*
Sports Park			
Six Full Sized Softball Diamonds	473,509 SF	1 Space per 1,000 SF per GLA	474
Four Full Sized Soccer Fields	277,200 SF	1 Space per 1,000 SF per GLA	277
Four Sand Volleyball Courts	4 Courts	5 Spaces per Court	20
Two Indoor Arena Soccer Courts	2 Courts	5 Spaces per Court	10
Softball/Batting Cages	9 Cages	1 Space per Cage	9
Skate Park	23,000 SF	1 Space per 1,000 SF per GLA	23
Three Concession/Service Buildings[3]	16,600 SF	10 Spaces per 1,000 SF	----
Two Children's Play Areas[3]	---- ----	----	----
Maintenance Building[3]	2,000 SF	----	----
Administration Building	2,300 SF	4 Spaces per 1,000 SF up to 20,000 SF and 2 Spaces per 1,000 SF for more than 20,000	9
		Subtotal	*822*
Total Parking Requirement (Youth Golf Center and Sports Park):			**899**
Proposed Parking Supply:			**746**
Parking Surplus/Deficiency (+/-):			**-153**

1 Source: City of Long Beach Title 21 Zoning Regulations: Chapter 21.41—Off-street parking and loading requirements. Note: GLA = Gross Land Area, SF = Square Footage

2 Source: RJM Design Group.

3 Parking requirement for ancillary uses (concession buildings, tot lots, maintenance building, etc.) included in parking for primary recreation components of the project.

vehicle ridership reflects that many trip origins to the site will come from home, with families, couples, and friends carpooling on the weekend. During this peak, a total of 937 players and spectators will be on-site.

When combined with a Zoning Code parking requirement of 77 spaces for the Youth Golf Facility, 23 spaces for the skate park, and 9 spaces for the batting cages, the Long Beach Sports Park is forecast to require a total of 734 parking spaces during weekends (625 + 77 + 23 + 9 = 734 spaces). When compared against the 746-space supply, the 734-space demand estimate corresponds to a parking surplus of 12 spaces, or a parking contingency of 2 percent.

Please note that the parking analysis assumes that all sports activities are running concurrently throughout the year. Based on information provided by City staff, the sporting events will be staggered throughout the 52 weeks of operation, with minimal overlap.

For additional information related to parking requirements and application of zoning code requirements, please refer to Section 4.1 of this EIR.

Congestion Management Program System Analysis

The Congestion Management Program (CMP) was created statewide as a result of Proposition 111 and has been implemented locally by the Los Angeles County Metropolitan Transportation Authority (LACMTA). The CMP for Los Angeles County requires that the traffic impact of individual development projects of potentially regional significance be analyzed. A specific system of arterial roadways plus all freeways comprise the CMP system. A total of 164 intersections in Los Angeles County are identified for system monitoring.

The proposed project will not add 150 or more trips (in either direction) during the weekday p.m. peak hours at CMP mainline freeway monitoring locations, as stated in the CMP manual as the threshold for a traffic impact assessment. Therefore, a CMP freeway traffic impact analysis is not required.

As stated earlier, the CMP guidelines require that arterial monitoring intersection locations must be examined if the proposed project will add 50 or more trips during either the a.m. or p.m. weekday peak hours (of adjacent street traffic) at CMP monitoring intersections. Based on the proposed project's trip generation potential, trip distribution, and trip assignment, the Long Beach Sports Park will not add 50 or more trips at the identified CMP intersections during the weekday p.m. peak hour. Therefore, a CMP intersection traffic impact analysis is not required.

Based on the results of this CMP evaluation, it is concluded that the proposed project will not have a significant traffic impact on the Congestion Management Program Highway System.

Public Transit

As previously stated, LBT provides transit services based on demand. There are no current plans for service expansion on the lines in the vicinity of the project site, and parks and recreation facilities are not typically major transit generators in the City of Long Beach.

LBT has determined that it can absorb the modest increases in ridership on existing lines and routes as a result of the project without adversely affecting the provision of service. Therefore, the proposed project will not have a significant impact on the provision of transit service.

Mitigation Measures

The significant traffic impacts of the proposed project can be mitigated through implementation of the following recommended mitigation measures. The proposed project can be expected to pay a "fair share" of the improvement costs associated with the construction of these improvements.

4.9.1 Prior to issuance of the first grading permit, the City of Long Beach, under the direction of the Director of Public Works, shall execute an agreement with the City of Signal Hill to contribute a fair share portion of the total costs for street improvements identified in Mitigation Measures 4.9.2 through 4.9.5. These fees shall be paid incrementally per lot or development site, prior to issuance of certificates of occupancy for such structures. Fees shall be provided by the City of Long Beach Director of Public Works.

4.9.2 **Atlantic Avenue at Spring Street:** Prior to issuance of any certificates of occupancy, the City of Long Beach, under the direction of the Director of Public Works, shall widen Atlantic Avenue to provide a separate northbound right-turn lane to proceed eastbound on Spring Street. Alternatively, in the event that needed right-of-way cannot be acquired, it is recommended that the traffic signal be modified to provide protected/permissive southbound left-turn phasing on Atlantic Avenue. Projected year 2006 p.m. peak-hour traffic volumes warrant the installation of separate left-turn phasing on Atlantic Avenue. The project's fair-share responsibility to implement this improvement totals 12.5 percent.

4.9.3 **Orange Avenue at Spring Street:** Prior to issuance of any certificates of occupancy, the City of Long Beach, under the direction of the Director of Public Works, shall convert the existing southbound right-turn lane to provide a second through lane on Orange Avenue, and restripe Orange Avenue south of Spring Street to provide two southbound departure lanes. Prior to issuance of any certificates of occupancy, the City of Long Beach shall also provide a separate eastbound right-turn lane on Spring Street to proceed northbound on Orange Avenue and modify the traffic signal per City of Signal Hill requirements. The project's fair-share responsibility to implement this improvement totals 39.1 percent. Implementation of this improvement is subject to approval of the City of Signal Hill.

4.9.4 **I-405 SB ramps at Orange Avenue:** Prior to issuance of any certificates of occupancy, the City of Long Beach, under the direction of the Director of Public Works, shall install a three-phase traffic signal at the I-405 southbound ramps and Orange Avenue intersection. The project's fair-share responsibility to implement this improvement totals 42.2 percent. Implementation of this improvement is subject to the approval of Caltrans.

4.9.5 **32nd Street at Orange Avenue:** Prior to issuance of any certificates of occupancy, the City of Long Beach, under the direction of the Director of Public Works, shall upgrade the existing signal from a pretimed (fixed time) signal to an actuated signal. The project's

fair-share responsibility to implement this improvement totals 28.0 percent. Implementation of this improvement is subject to the approval of the City of Signal Hill.

4.9.6 **Project Driveway Nos. 3 and 5:** Prior to issuance of certificates of occupancy, the City of Long Beach, under the direction of the Director of Public Works, shall install street improvements and signage restricting access to "right in/right out" at Project Driveway Nos. 3 and 5. The City of Long Beach may also install a "pork chop" in the Project Driveways to restrict the turning movements of vehicles exiting the project site. Implementation of these improvements is subject to the approval of the City of Signal Hill.

4.9.7 **Orange Avenue at 28th Street/Project Driveway No. 4:** Prior to the issuance of any certificate of occupancy, the City of Long Beach, under the direction of the Director of Public Works, shall install a traffic signal at the intersection of Orange Avenue and 28th Street per City of Signal Hill requirements. Implementation of this improvement is subject to the approval of the City of Signal Hill.

4.9.8 Prior to the issuance of a grading permit, the City of Long Beach shall, under the direction of the City of Long Beach Traffic Engineer, design and implement a construction area traffic management plan. The plan shall be designed by a registered Traffic Engineer and shall address traffic control for any street closure, detour, or other disruption to traffic circulation and public transit routes. The plan shall identify the routes that construction vehicles will use to access the site, the hours of construction traffic, traffic controls and detours, off-site vehicle staging areas, and parking areas for the project. The plan shall also require the City to keep all haul routes clean and free of debris including, but not limited to, gravel and dirt.

4.9.9 Prior to issuance of grading permits, the City of Long Beach shall, under the direction of the Director of Public Works, complete a detailed sight distance analysis for the proposed project driveways along Orange Avenue. The sight distance analysis shall be prepared according to the City of Long Beach Zoning Code and the Caltrans Highway Design Manual standards and guidelines, and indicate limited use areas (i.e., low height landscaping), and on-street parking restrictions (i.e., red curb), if necessary. The findings of the sight distance analysis shall be included in a report subject to review and approval by the Directors of Planning and Building and Public Works, or designees.

Project Circulation Improvements included in the Project Description and as Mitigation: In conjunction with the Long Beach Sports Park development, the following roadway improvements bordering the project site will be completed. To ensure implementation of these improvements takes place in a timely manner, they are shown on project plans and also included below as mitigation measures.

4.9.10 **Orange Avenue:** In conjunction with the development of the Long Beach Sports Park, the City of Long Beach, under the direction of the Director of Public Works, shall widen and improve Orange Avenue bordering the project site in accordance with the City of Signal Hill Secondary Highway street standards and the streetscape concepts included in this EIR (Section 4.12, Aesthetics). South of Spring Street, Orange Avenue is designated

as a Secondary Highway in the City of Signal Hill Circulation Element with an 80-foot-wide right-of way section. Improvements will be completed prior to issuance of any certificates of occupancy for the project site. Implementation of this improvement is subject to the approval of the City of Signal Hill.

4.9.11 California Avenue: In conjunction with the development of the Long Beach Sports Park, the City of Long Beach, under the direction of the Director of Public Works, shall widen and improve California Avenue along project frontage in accordance with the City of Signal Hill Secondary Modified Highway street standards and the streetscape concepts included in this EIR (Section 4.12, Aesthetics). South of Spring Street, California Avenue is designated as a Secondary Modified Highway in the City of Signal Hill Circulation Element with a 70-foot right-of way section. Improvements will be completed prior to issuance of any certificates of occupancy for the project site. Implementation of this improvement is subject to the approval of the City of Signal Hill.

4.9.6 CUMULATIVE IMPACTS

Information concerning cumulative projects (planned and/or approved) in the vicinity of the project has been researched at the City of Long Beach and the City of Signal Hill. Based on this research, there are 34 related projects located in the City of Long Beach and 10 related projects in the City of Signal Hill. Table 4.1.K provides the location and a brief description for each of the 44 related projects, while Figure 4.1.8 graphically illustrates the location of the related projects. These related projects are expected to generate vehicular traffic, which may affect the operating conditions of the key study intersections.

Table 4.9.K provides a summary of the cumulative projects in the Cities of Long Beach and Signal Hill with the corresponding forecast weekday p.m. peak-hour traffic volumes, weekend midday peak-hour traffic volumes, and daily traffic volumes.

Table 4.9.K: Related Projects Traffic Generation Forecast[1]

		Weekday				Weekend Day (Saturday)			
		Daily	PM Peak Hour			Daily	Midday Peak Hour		
	Related Projects Description	2-Way	In	Out	Total	2-Way	In	Out	Total
City of Long Beach:									
1)	Pine Villas (63 DU)	219	4	3	7	158	11	8	19
2)	Alamitos Ridge Residential (106 DU)[2]	1,014	69	39	108	1,070	54	46	100
3)	CSULB Technology Park (200,000 SF Industrial/200,000 SF R&D)	3,016	56	356	412	644	38	38	76
4)	Self-Storage (92,000 SF)	230	12	12	24	214	18	19	37

[1] Source: Trip Generation, 6th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (1997).
[2] Source: Traffic Impact Study for Alamitos Ridge prepared by LLG Pasadena (December 9, 2002).

Table 4.9.K: Related Projects Traffic Generation Forecast[1] (continued)

Related Projects Description	Weekday				Weekend Day (Saturday)			
	Daily	PM Peak Hour			Daily	Midday Peak Hour		
	2-Way	In	Out	Total	2-Way	In	Out	Total
5) Pharmacy (15,200 SF)[2]	1,232	27	28	55	1,232	27	28	55
6) N.L.B. Police Station (20,000 SF)[3]	980	41	57	98	980	41	57	98
7) Medical Office (105,800 SF)	3,823	105	282	387	948	219	165	384
8) Apartments (66 DU)	438	28	13	41	422	18	16	34
9) Retail/Fast-Food (7,000 SF/1,500 SF)[2]	940	22	21	43	1,290	34	33	67
10) Retail (11,984 SF)[2]	463	15	15	30	539	21	19	40
11) Locust Avenue Condominiums (82 DU)	481	30	15	45	465	21	18	39
12) Self-Storage (516,000 SF)	1,290	67	67	134	1,202	103	103	206
13) Pharmacy W/Drive Thru (11,550 SF)[2]	916	30	31	61	916	30	31	61
14) Retail (15,000 SF)[2]	580	18	19	37	675	26	24	50
15) Office/Retail (6,150 SF/6,150 SF)[2]	394	22	80	102	308	13	12	25
16) Mark Twain Public Library (16,000 SF)	864	54	59	113	745	57	51	108
17) Retail (5,750 SF)[2]	222	7	7	14	258	10	9	19
18) Medical Office (7,200 SF)	260	7	19	26	65	15	11	26
19) Retail (5,800 SF)[2]	224	7	7	14	261	10	9	19
20) Alamitos Green Residential (15 DU)[4]	144	10	5	15	151	8	6	14
21) Elementary School (1,450 Students)[4]	1,479	0	0	0	0	0	0	0
22) Daugherty Sky Harbor[5]	1,760	45	190	235	265	21	16	37
Subtotal: City of Long Beach Development No. 1 - 22 Trip Generation Potential	**20,969**	**676**	**1,325**	**2,001**	**12,808**	**795**	**719**	**1,514**
23) Retail (6,700 SF)	259	8	9	17	301	11	11	22
24) Self-Storage (55,000 SF)	138	7	7	14	128	11	11	22
25) Retail (4,000 SF)[2]	155	5	5	10	180	6	7	13
26) Retail (6,230 SF)[2]	240	7	8	15	280	10	10	20
27) Affordable Condominiums (43 DU)	252	15	8	23	244	11	9	20
28) Retail (1,950 SF)[2]	76	2	3	5	87	3	4	7

1 Source: Trip Generation, 6th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (1997).

2 The trips presented above include adjustments for pass-by. Source: Trip Generation Handbook, ITE October 1998. The following pass-by reduction factors were utilized:
- Land Use 820: Shopping Center (Daily = 10% and PM Peak Hour = 34%)
- Land Use 834: Fast-Food Restaurant W/Drive-Through (Daily = 10%, AM Peak Hour = 49% and PM Peak Hour = 50%)
- Land Use 880: Pharmacy (Daily = 10% and PM Peak Hour = 53%)
- Land Use 881: Pharmacy W/Drive-Through (Daily = 10% and PM Peak Hour = 49%)

3 Source: Traffic Impact Study for North Long Beach Police Station prepared by LLG Costa Mesa (December 15, 2000).

4 Source: Traffic Impact Study for Alamitos Ridge prepared by LLG Pasadena (December 9, 2002).

5 Source: Operations Analysis prepared by LLG Costa Mesa (December 15, 2000).

Table 4.9.K: Related Projects Traffic Generation Forecast[1] (Continued)

Related Projects Description	Weekday				Weekend Day (Saturday)			
	Daily	PM Peak Hour			Daily	Midday Peak Hour		
	2-Way	In	Out	Total	2-Way	In	Out	Total
29) General Light Industrial (159,185 SF)	1,110	19	137	156	210	11	11	22
30) Pharmacy (11,656 SF)[2]	945	21	21	42	945	21	21	42
31) Affordable Condominiums (60 DU)	352	22	11	33	340	15	13	28
32) Java Lanes Condominiums (79 DU)	463	28	14	42	448	20	17	37
33) General Light Industrial (6,000 SF)	42	1	5	6	8	1	1	2
34) General Light Industrial (101,000 SF)	704	12	87	99	133	7	7	14
Subtotal: City of Long Beach Development No. 23 - 34 Trip Generation Potential	**4,736**	**147**	**315**	**462**	**3,304**	**127**	**122**	**249**
Total: City of Long Beach Development Total Trip Generation Potential	**25,705**	**823**	**1,640**	**2,463**	**16,112**	**922**	**841**	**1,763**
City of Signal Hill:								
35) Home Improvement Center[3]	10,696	433	458	891	17,297	800	707	1,507
36) Hill Top Specific Plan[3]	2,094	135	71	206	2,109	100	86	186
37) A and A Ready Mix (25 Trucks)	200	9	21	30	0	0	0	0
38) Gundry Estates (11 SFD)	105	7	4	11	111	6	5	11
39) Hathaway Estates (20 SFD)	191	13	7	20	202	10	9	19
40) U.S. Storage (130,000 SF)	325	17	17	34	303	26	26	52
41) Long Beach BMW (96,000 SF)	240	12	12	24	224	19	19	38
42) DCI Light Industrial (18,400 SF)	128	2	16	18	24	1	1	2
43) Cherry/19th Condominiums (41 DU)	240	15	7	22	232	10	9	19
44) GTE Middle School (850 Students)	1,233	68	68	136	0	0	0	0
Total: City of Signal Hill Development Total Trip Generation Potential	**15,452**	**711**	**681**	**1,392**	**20,502**	**972**	**862**	**1,834**
Grand Total Related Projects No. 1 - 44 Trip Generation Potential	**41,157**	**1,534**	**2,321**	**3,855**	**36,614**	**1,894**	**1,703**	**3,597**

As shown on a "typical" weekday, the cumulative projects can be expected to generate 41,157 daily trips with 3,855 trips (1,534 entering and 2,321 exiting) occurring during the p.m. peak commute

1 Source: Trip Generation, 6th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (1997).

2 The trips presented above include adjustments for pass-by. Source: Trip Generation Handbook, ITE October 1998. The following pass-by reduction factors were utilized:
- Land Use 820: Shopping Center (Daily = 10% and PM Peak Hour = 34%)
- Land Use 834: Fast-Food Restaurant W/Drive-Through (Daily = 10%, AM Peak Hour = 49% and PM Peak Hour = 50%)
- Land Use 880: Pharmacy (Daily = 10% and PM Peak Hour = 53%)
- Land Use 881: Pharmacy W/Drive-Through (Daily = 10% and PM Peak Hour = 49%)

3 Source: Traffic Impact Study for Home Depot prepared by Urban Crossroads (December 2000).

hour. During a "typical" weekend day (Saturday), the cumulative projects can be expected to generate 36,614 daily trips with 3,597 trips (1,894 entering and 1,703 exiting) during the noon peak hour.

The 34 related projects in the City of Long Beach are expected to generate 25,705 trips on a daily basis, with 2,463 trips occurring in the p.m. peak hour during a "typical" weekday and 16,212 weekend daily trips, with 1,763 trips occurring in the weekend midday peak hour.

The 10 related projects located in the City of Signal Hill are expected to generate 15,452 trips during a "typical" weekday and 20,502 trips on a "typical" weekend day, with 1,392 trips occurring in the weekday p.m. peak commute hour and 1,834 trips occurring in the weekend midday peak hour.

One related project not considered in the cumulative traffic analysis is the PacifiCenter @ Long Beach project. The PacifiCenter project site is located five miles northeast of downtown Long Beach and immediately north of the Long Beach Municipal Airport. The PacifiCenter project is a master-planned mixed-use development consisting of 3,150,000 sf of commercial uses (office park), 255 single-family homes, 1,220 apartments, 1,025 condominiums/townhomes, 150,000 sf of retail uses, and a 400-room hotel. The PacifiCenter project was not included as part of the Year 2006 cumulative traffic setting because the anticipated completion year for this related project is the Year 2020, which is outside of the horizon year for the proposed Long Beach Sports Park (Year 2006) and due to the distance of the proposed project from the traffic impact analysis study area.

An analysis of future (Year 2006) background traffic conditions indicates that the addition of ambient traffic growth and cumulative project traffic will adversely impact 9 of the 18 key study intersections during the weekday p.m. peak commute hour. The intersections of Atlantic Avenue at Willow Street, Cherry Avenue at Willow Street, Atlantic Avenue at Spring Street, and Cherry Avenue at Spring Street, as well as the I-405 SB off-ramp approach at Orange Avenue, are forecast to deteriorate one service level and operate at LOS F during the weekday p.m. peak commute hour. The intersections of Orange Avenue at Willow Street, Orange Avenue at Spring Street, 32nd Street at Orange Avenue, and California Avenue at Wardlow Road are forecast to operate at LOS E in the Year 2006 background condition during the p.m. peak hour with the addition of ambient traffic and related projects traffic. The remaining nine key study intersections are forecast to operate at LOS D or better during the weekday p.m. peak hour.

An analysis of future (Year 2006) background traffic conditions indicates that the addition of ambient traffic growth and cumulative project traffic will adversely impact one of the 18 key study intersections during the weekend day midday peak hour. Although the unsignalized intersection of the I-405 SB ramps at Orange Avenue overall operates at LOS A during the weekend day midday peak hour, the minor street (I-405 SB off-ramp) approach is forecast to operate at LOS E with the addition of ambient traffic and related projects traffic. However, with implementation of Mitigation Measure 4.9.4, project impacts to this intersection will be reduced to below a level of significance. The remaining 17 key study intersections are forecast to operate at LOS D or better during the weekend day midday peak hour. Therefore, additional mitigation is not required to reduce the project's contribution to cumulative impacts to below a level of significance.

4.9.7 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The significant traffic impacts of the proposed project can be mitigated to below a level of significance with implementation of the mitigation measures identified above. However, implementation of Mitigation Measures 4.9.3, 4.9.4, 4.9.5, 4.9.6, and 4.9.7 requires action by one or more public agencies other than the City of Long Beach. Since implementation of these measures is completely or partially within the control of other jurisdictional agencies (i.e., Caltrans, City of Signal Hill), implementation cannot be ensured by the City of Long Beach. Should the City of Signal Hill and/or Caltrans choose not to implement these measures, the related project impacts may remain significant and adverse.

For the purposes of this EIR, project impacts to the following intersections will remain significant and adverse until the appropriate Responsible Agency approves and implements Mitigation Measures 4.9.3, 4.9.4, 4.9.5, and 4.9.7:

- Orange Avenue at Spring Street (Mitigation Measure 4.9.3)
- I-405 SB Ramps at Orange Avenue (Mitigation Measure 4.9.4)
- 32nd Street at Orange Avenue (Mitigation Measure 4.9.5)
- Orange Avenue at 28th Street/Project Driveway No. 4 (Mitigation Measure 4.9.7).

Approval from the City of Signal Hill is also required to install street improvements and signage restricting access to "right in/right out" at Project Driveway Nos. 3 and 5 per Mitigation Measure 4.9.6. Until the appropriate Responsible Agency approves and implements Mitigation Measure 4.9.6, project impacts to the minor street approach (28th and Project Driveway No. 3) to the intersection of Orange and 28th Street will remain significant and adverse.

While operating within the limits of the interjurisdictional decision-making processes, the City of Long Beach is committed to working with Caltrans and the City of Signal Hill to implement these mitigation measures to the best of its ability.